COAL AGE

Vol. 2 NEW YORK, SEPTEMBER 14, 1912 No. 11

THE subject which most interests owners of coal mines is the cost per ton of output. This cost, aside from that for overhead charges, royalties and extinguishment, can be divided into three general classes: 1. The scale paid per ton for mining and loading. 2. The total wage of the company laborers employed. 3. The money expended for supplies.

While the scale rate per ton is more or less fixed, the two other items which run up the cost of the coal are variable, and of these the latter, the expenditure for supplies, is the more likely to be augmented by leakage. Consequently, the greatest of economy should be practiced in the handling of all material. Different kinds of equipment which are actually needed in a mine should always be furnished to the foreman, but in many cases, there is a needless waste of scrap which could be used to advantage.

A mine foreman is much like an economical housekeeper, who saves all her scraps, and "left overs" from the dining-room table, and by a little mixing and seasoning prepares a dish which is more toothsome than any of the original ingredients.

The mine foreman, like the good house-keeper, can by keeping track of his scrap material, utilize practically all of it, and at the same time better his record, by making a reduction in his operating expenses. The scrap which cannot be used in the mine should be kept in a pile, and when enough has accumulated it should be sold, and the mine foreman given credit for it on his monthly cost sheet.

Scraps of rails, often left scattered through the mine, should be assembled at some central point, from whence they can be sent to the shop, and be made into guard rails, small frogs, or used for re-inforcing work.

Several years ago a general superintendent decided to put steps in an air shaft so as to make another escapeway from a deep slope. For various reasons the steps were built but not placed. They were made in 10-ft. sections, 3 ft. wide, with the tread made of plates ¼-in. thick, 3 ft. long and 8 in. wide. In addition to the steps were many channels and plates.

Practically all these treads were changed slightly and used instead of rails for flooring overcasts. The channels were used in making fireproof door frames, and by riveting two together, they were made available for use as I-beams. The plates were used in making plat frogs, and small sheet-iron doors.

Cross ties which are no longer fit for main-haulage tracks can be used on temporary roadways. In one instance many old ties were used in relaying track in a short entry from which the pillars were to be robbed. Old ties were reversed so that the spike holes faced the mine floor and by adding a few new ones and distributing them judiciously, a track was put down which answered every purpose, and at the same time saved money for the company.

Short pieces of lumber which are in good condition may be sawed up, and used as cap boards. In tearing down old buildings, trestles, etc., it often occurs that timber can be found which can be readily used in the mine.

Short pieces of pipe should never be thrown away, if not old and pitted, for they can be used for nipples and repair work. This depends on their condition. By building a small furnace from scrap sheet iron, old house-furnace grates and firebrick, the U. S. Coal & Coke Co. in southern West Virginia at a small cost for aluminum and zinc annually utilizes thousands of pounds of scrap copper wire in making brass bushings for mining machines and pumps.

Scrap iron which cannot be utilized in any way should never be allowed to accumulate in large quantities or unsightly heaps. This practice is utterly disastrous to neatness, which in turn destroys or tends to destroy morale.

There are dozens of other instances which could be mentioned where scraps can be utilized. After all "it is the little things that count," and any foreman who looks after his scraps, and puts them to some use, not only saves money for his company and lowers his cost, but also places himself in line for promotion, for there is room at the top for wide-awake foremen who can do a few things besides "hustle coal."

[*Written by W. M. Lacey, Dolomite, Ala.*]

Ideas and Suggestions

Interesting Talks Submitted in Response to Our Recent Request for Forewords.

The Mining Man

By B. L. Flynn*

The mining man is the one upon whom the success of the operation principally depends; if good dividends are paid, a large portion of the credit is due him. In many cases he designs the plant, builds it, keeps it up and runs it.

Civil and mining, electrical and mechanical engineer, diplomat, strategist, bookkeeper and accountant, he must be quick to act in emergencies, of which a plentiful supply is assured. To him are referred all the problems that arise in every department from the office to the coal face.

Today he may lay out some entries to develop a body of coal, start a ditch to eliminate expensive pumping, show a machineman or motorman how to take care of his machine, instruct a miner to set a prop under some bad rock (and then persuade him to set it at once instead of waiting "until I load this car.")

Yesterday he had a talk with Bill Brown who "wasn't going to work that south entry any more and load three-ton cars for 50c., but was going over to Smith's mine where a man could make some money." It took an hour of valuable time to convince Bill that the south entry was the most desirable place in the region to work and that the cars were unusually small for the money.

Last night he checked up the supply account for the first half of the month, figured on the tipple expense, helped make an emergency repair in the power plant and went up into the camp to investigate the report that "Sam Johnson was drunk again and tearing the house down to throw at his wife."

Tomorrow he is going to figure out a new motor haul to take care of an increased tonnage, look into that dip-heading pump that hasn't been working right lately, find out what is the matter with the power in the "left workings" and have the carpenters build a back porch on No. 49 house and put a new roof on No. 28.

Next week he is going to build a new barn, buy two mules, find out how so much fine coal passes over the screens with the lump and estimate on a loading boom for the latter—also (if he gets time) he intends to prospect that seam in the top of the hill and figure on a plant to work it.

The successful mining man could, with but little training, qualify for a position in almost any other industry, as his trade is essentially a combination of all others. However, as for quitting the business—not he! The combination of excitement, perplexities, uncertainties and trouble has such a fascination for him that he will always be just—A MINING MAN.

*General superintendent, Manitoba Coal Co., Ethel, W. Va.

The Design of Coal Screens

By Henry F. Pfening*

Screening coal is the hardest problem that confronts the mine operator today. Of the hundreds of mines we have in our country, it is seldom that we find conditions the same in any two, especially in hill mines. The coal varies in elevation on the hill; probably in the distance of two miles it will vary as much as twenty feet. Coals are of different nature; some are soft and some hard and splinty. Again the climate has certain effects which must be considered. These with many other obstacles, such as different kinds of cars to be loaded on the same track and different kinds of coal to be loaded in the same car with the least amount of breakage all go to make up a hard problem for the designer. We will pass by this little review of obstacles and take up a few of the designs we already have for filling the above conditions.

Types of Screens

First comes the gravity screen, the most common of all in the small mines because of its small first cost and its cheapness in operating; certainly not for its merit. In the first place its own name causes us to realize breakage. For a screen that is steep enough to run coal by gravity is steep enough to cause such speed that no small amount of breakage occurs. If this gravity screen could be adjusted to suit each and every car which passes it, we then would have the best and only screen in the gravity type. But no man has yet designed the screen of this kind which will successfully handle a car of small wet coal and a car of large dry coal as well. For when the screen is at such an angle that it will screen the wet coal it will cause the dry coal to move at such a speed that it will not only break it, but carries large amounts of slack over with the lumps.

Then comes the revolving screen, which is not a successful screen for lump coal, because it carries the lump coal over the center and then drops it causing considerable breakage, but for fine coal it is the best screen we have found. First, because it offers more screening surface and can be set at a less angle than any other screen and can be regulated as far as speed is concerned very easily. While it has these advantages it has many disadvantages. Since it has proved to be the best we have for fine coal we will not rebuke it by rehearsing them.

Next comes the shaker screen which has been a long difficult problem all through the hard-coal region and is now being taken up by the operators of soft coal. While some have had success, others have failed. Shaking screens are certainly the solution for lump coal, but are not so good for fine coal, because speed enough to keep the fine coal from clogging and riding the screens cannot be well obtained without destruction to the most substantial tipple or at least the tipple which the average small mine car afford. It is found that the shaking screen which will just keep the coal moving is better than the screen that carries it off quickly, for when moving slow the large lumps will move faster and stumble over small ones causing

*Engineer, Paintsville, Ky.

the larger to turn over knocking all the slack off which might happen to be riding over the screens upon them. This is sometimes helped by adding step screens where the coal first passes over the steps which are from 4 to 6 in. high and will cause the lumps to turn over or at least cause them to tilt at an angle such that the slack may work off. It is found for soft coal that 50 ft. a minute is about the proper speed, when the screen is at a pitch of about 3 in. to the foot. The screening surface should not be less than 60 sq.ft. for each grade.

THE SUCCESSFUL SCREEN DESIGNER

For a man to be a designer of coal-screening machinery he must first be a good engineer, and second he must be a coal man by experience. I do not mean he should be a man who has gone all over the country looking for other men's ideas, but one who has worked in the position of trimmer, car dropper, slate picker, etc. That is the man who can take your conditions and analyze them. He will test your coal for hardness, he will note how much fall it can stand, how easy it is to scale or break, what you want to load it in, how you want to load it and give you a more nearly correct solution to the problem. He will also give you a plant that will not break you up with repairs.

The great trouble with too many designers is that they have the technical knowledge but lack the practical experience. They are capable of making things show up on paper, but are far from being capable of designing screens that will screen your coal at the smallest possible operating cost, and with the lowest expense for repairs.

Some Thoughts Concerning Safety

By William J. Howard*

Regardless of the fact that all possible precautions are taken by mine owners to safeguard their employees, the fact still stares us in the face that disastrous explosions still occur in the most carefully managed mines.

Therefore, it is at once apparent that the only thing we can do is to prepare ourselves so as to give the quickest help possible to the unfortunate workers underground, and thus lessen the heavy loss of life.

It is interesting to note the good work being done by the Bureau of Mines in its rescue training, and it is something that should be taken advantage of by all mine owners, operators and workmen.

The average mine superintendent does not realize what good work can be done by a trained party of local or company employees (men who are familiar with the workings of their own mine), in case of an explosion or underground fire. Think of the lives that might be saved by promptly sending in the company's own rescue party, instead of waiting for help from a neighboring town.

*Castle Gate, Utah.

And, Mr. Superintendent, ask yourself these questions: Are your rescue apparatus in perfect working order, ready for any emergency? Are the reducing valves of your oxygen helmets in good shape? Has the captain of your rescue team carefully examined the apparatus at least twice during the last week? Has the team had its weekly practice regularly? Have you got your team divided into two companies, one of which is outside the mine, when the other is inside?

It would be easy to organize a company of outside employees and have them travel the underground entries of your mine at certain periods, and thus be familiar with the workings at all times. Do not forget to have some of your first-aid men in this rescue party. Who would be a better captain for the inside company than the mine foreman? Who would be a better leader for the outside company than the outside foreman?

Is your apparatus kept in a safe place at convenient distance from the entrance to your mine?

Are these things worth considering when you think of the number of lives in your care? Do you think the expense too great, when you think of the lives you may save by being prepared? Can you afford to take chances when you fully realize the small causes that bring about mine explosions? And can you afford to hesitate when possibly one of these small defects may be found in your mine tomorrow, and thus hurl the hundreds of men in your charge into eternity?

It is good at all times to think and act according to the old maxim, "Prevention is better than cure." However, we are all beginning to realize now that every known method is in use for the prevention of such calamities, and still we see and read of mine explosions accompanied by heavy loss of life. There is no doubt but that such disasters will occur so long as mining is an industry. Let us all, therefore, take an interest in the next best thing, which is to prevent as far as possible these disastrous results.

Let these thoughts sink deep into the minds of each and every coal man, and I am sure that we will meet with great success if we only think of what is at stake. Let us take for our motto the following: "Save the lives of others, if possible, even at the cost of our own."

Haulage Roads in Coal Mines

By Henry McCluskey*

The haulage roads in coal mines should be laid on the solid floor of the mine. They should be well ballasted and should have good clean ditches on the lower side of the entry, so that the rails may be dry at all times, and the mine water cannot injure them by the action of the acid which it contains. The grades depend on the conditions of the mine but if possible they should be in favor of the load. Where hauling is done by locomotives the weight of the rails should be determined by the size of the mine cars used and also by the motive power required.

*Gradatim, Allegheny Co., Penn.

Ties should be spaced about 2 ft. apart, center to center. The rail should be well spiked to the ties with four spikes to each tie, the joint between two rails on one side of the track being located about midway between two joints on the opposite side. Care should be taken in placing the spikes to provide that they are not all in the center of the tie, because if they are, they are sure to split it. I have seen this done many times, but my track men generally profited by this mistake. In spiking down the rails it is best to drive two spikes on the inside of the rail and on one side of the center of the tie; then drive two others on the outside of the rail and on the opposite side of the tie center. With the spikes so placed there is no danger that the tie will slide.

The ties should not be too long as this gives much trouble when repairing the tracks and all ties should have sufficient face so as to insure a good footing for the rail. They should be so thick that the spikes will not drive through them.

The ends of the ties should be lined up on one side of the track so that they

are all the same distance from the rail. With each tie placed in this manner, you have a fair track and if well tamped and kept reasonably solid, there is not much danger of having any trouble on your hauling road. On bends the ties should be laid so as to form a neat curve which should be of such length that the locomotive and mine cars will not lock in going around it. I have seen lots of trouble from this cause in mines where I have worked.

The gage of the track in the coal mines of this district should be in my opinion not less than 36 nor more than 42 in. I am not in favor of a broad gage in coal mines because it is much easier to go round curves with lighter cars and motor. Generally where the broad gage is in use, the rolling stock is much heavier. Any man knows what this entails when anything goes wrong, and it is much harder on the miner where he has to push the empty pit car into his room or entry.

The switches or latches most commonly used in the coal mines of this district on the main partings which are in constant use, are the ordinary railway frog with the latches constructed of wedge-shaped bars of iron made as high as the rail, with an eye in the thick end. They are connected together with a rod attached to a lever so that they may be moved at once from the side of the track where the locomotive has to enter, or to swing in the empty trip.

On the opposite side of the parting where the loads enter, the switches are made self-closing, so as to run all the cars of the inside working at this point to the parting, the switch then only being used to admit cars to the main parting. By attaching the latches through a lever to a spring made of a piece of 16-lb. T-iron long enough to give them sufficient travel, when the empty cars pass through, this spring will pull the latches back again to their proper place. This is a handy contrivance and if kept in proper shape will not cause any trouble.

On all entries used as main haulage roads, turnouts should be constructed at convenient intervals to allow the loaded and empty trips to pass and should be made long enough to handle from 6 to 8 cars. The switches at each end may be made self-closing as stated above. If this system of haulage roads were adopted in some of the mines with which I am acquainted where it is not used, there would not be so many wrecks nor would the foreman have so much worry.

A Western Coal Mining Institute

We have received a number of letters relative to the formation of a coal-mining institute in the western states, but we cannot publish them all. The following indicate clearly the favorable attitude of those concerned. A plan for the organization of an institute is already under way to comprise Colorado, Wyoming, New Mexico and Utah. A few subscribers have suggested names of prominent coal men, any one of whom might act as temporary chairman.

In the meantime we sincerely request that all our readers who have not already expressed their opinion or named a chairman should write to us stating their preferences.

A. C. Watts, chief engineer Utah Fuel Co., has written us as follows:

"With reference to the organization of a coal-mining institute in Wyoming, Colorado and New Mexico as suggested in the Aug. 24 issue of COAL AGE, I wish to say that I believe it would be a desirable and profitable step to take and that there are undoubtedly a number of coal-mining men in Utah who would be glad to have this state included and start as charter members.

"There are many delightful places in the intermountain region suitable for convention purposes and the benefit which would arise from a closer acquaintance and exchange of ideas among our operators would prove invaluable to all."

J. E. Pettit, State Mine Inspector of Utah, sends the following communication:

"Mr. Murray's letter in the Aug. 24 issue of COAL AGE, in reference to a Western Mining Institute, is a clear statement of the thoughts which have passed through the minds of scores of western coal-mining men during the past few years and is a matter which should be taken up by every live mining man of the western coal-mining states.

"In our opinion all that is necessary is for someone to step to the front and either issue a call for such a meeting, or appoint a committee from each of the western states to canvass them in behalf of such an institute and report their success at a stated time. Utah mining men will welcome such a step for the discussion of the vital points concerned in the safety of our mines and the education of our miners."

The following letter has been received from J. S. Miller, General Manager, Southern Superior Fuel Company:

"I notice, in your issue of Aug. 24, an article pertaining to a mining institute which might be organized advantageously in Colorado and other states. I may say that no organization could be started which would be more essential to the mining industry than one of this kind.

"I have always thought that the mine owners and superintendents of Colorado and other states do not get together or visit each others' mines often enough to find out any other condition which may be existing in the adjoining mines, and are guided only by what they happen to read in the newspapers.

"I was a delegate to the meeting of the Mining Congress, which was held at the University of Illinois some six or seven years ago. It lasted three days, and among those present were operators, presidents, general managers, mine superintendents, state coal-mine inspectors, mining engineers and mining experts who had visited some of the largest collieries in Scotland, England and Wales. There was an exchange of valuable ideas, and much good resulted to all who were present.

"Some of the speakers at that meeting discussed explosions of dust, excessive use of powder, dead holes, gas and mine fires in the coal and gob; others talked on what precautions and methods should be taken to prevent these disasters. I do not believe that there is a coal man in the West but would be glad to spend one, two, or three days at a meeting of this kind, if he is interested at all in the welfare and health of his men and in the safety of his property.

"I am ready to start the ball rolling by nominating W. J. Murray, general manager of the Victor American Fuel Company, Denver, Colo., as chairman, that he may name the time and place of meeting and invite everyone who is interested."

[*Now that the movement to launch a Western Coal Mining Institute is fairly under way, the matter can soon be brought to a head if each man who is interested will write us signifying his desire to become a charter member of the new organization. All such communications will be turned over by us to the committee appointed to call the first meeting. It may be quite an honor at no far-distant date to say you lent a hand at the birth and christening of the "Western Coal Mining Institute."—Don't delay. Come forward now.—Editor.*]

An English method of preserving timbering from dry rot is to allow water to constantly trickle over it. This is effective, but reduces the strength of the timber about one-half. Whitewash and creosote are also used in English mines. Creosote renders the timbers more inflammable. Other preservatives used abroad are sulphate of iron and chloride of magnesium. Timber soaked for 24 hours in sulphate of iron will last eleven times as long as if untreated. Timber boiled in a solution of chloride of magnesium and common salt, one of the former and seven of the latter, has its life increased three fold and is also rendered non-inflammable by the impregnation of salt.

European Bunkering Methods

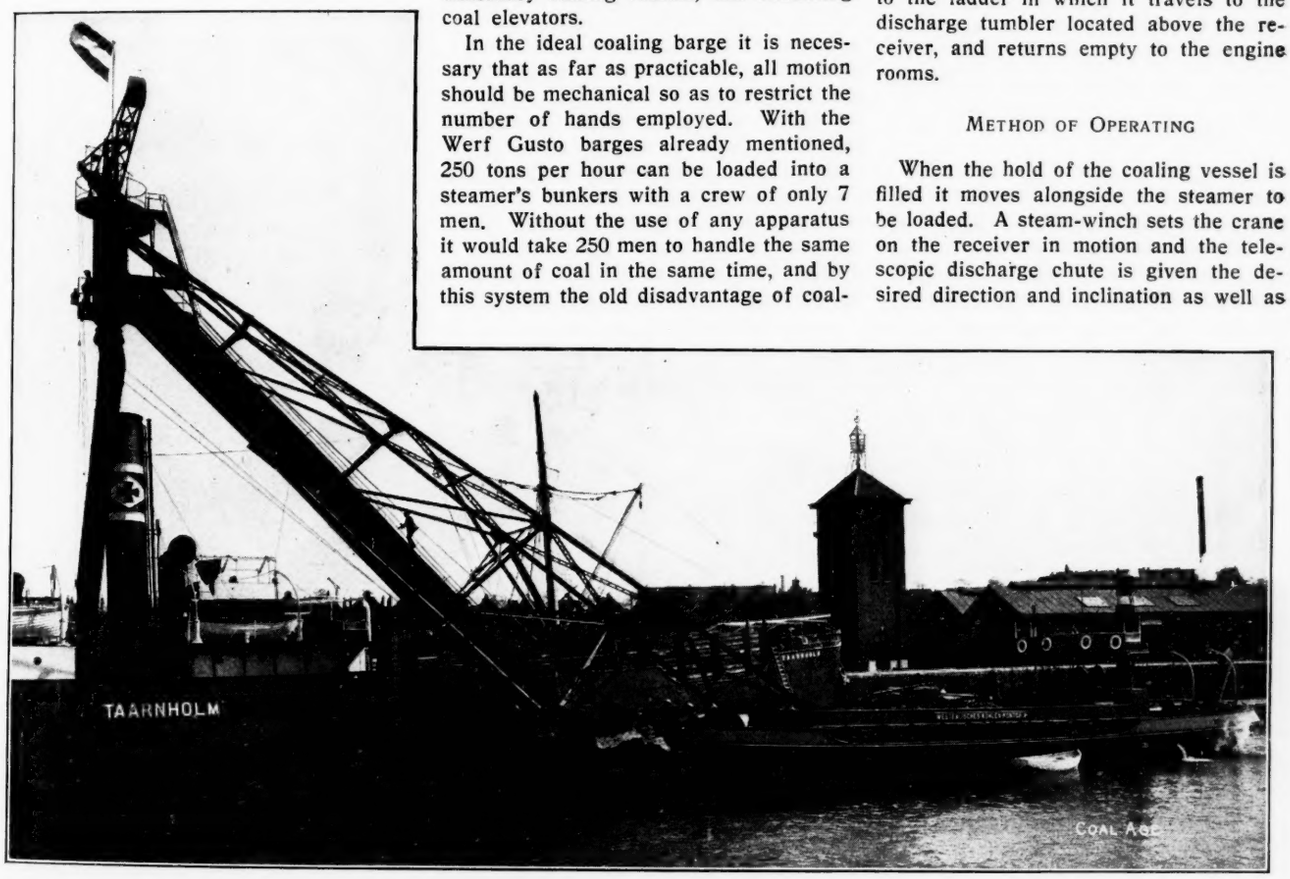
Special Correspondence

A description of the more modern coaling appliances used in Great Britain and other countries. Rapid advances have been made in this branch of the industry during recent years. It is now possible to coal the large liners at a speed of 500 tons per hour without interfering with loading the cargo.

During recent years numerous, and more or less successful attempts have been made to improve upon the old methods of coaling vessels, and one of the best systems which have been evolved is the coaling barges built by a firm at Schiedam, Holland. There are many difficulties to be surmounted on work of this character and procuring the advice of the shipping men who were interested in the bunkering trade, experiments were started by this concern in the construction of coal elevators. The process of coaling ship is generally looked upon as a necessary evil to be borne with patience, but it is not so troublesome if a good appliance can be had.

The range of bunkering apparatus is covered by three distinct classes as follows: Self-propelling coaling vessels, stationary coaling vessels, and bunkering coal elevators.

In the ideal coaling barge it is necessary that as far as practicable, all motion should be mechanical so as to restrict the number of hands employed. With the Werf Gusto barges already mentioned, 250 tons per hour can be loaded into a steamer's bunkers with a crew of only 7 men. Without the use of any apparatus it would take 250 men to handle the same amount of coal in the same time, and by this system the old disadvantage of coal-dust flying about everywhere is also removed.



VIEW SHOWING THE ORDINARY TYPE OF SELF-PROPELLING COALING VESSEL

THE WERF GUSTO APPARATUS

The first experiments were conducted in conjunction with the Rotterdam Coal Trading Association and that their system was successful, is shown by the fact that four orders followed each other in quick succession. Later a syndicate of German coal traders, after making a tour of Europe and America in search of a simple, strong and economical coaling apparatus, decided on those constructed at Schiedam, and these are now established at many continental ports.

Though there are three types of coaling vessels their construction and *modus operandi* are practically similar. After the hull has been constructed the holds are strengthened by transverse bulkheads which divide it into compartments with sides sloping towards the center. In certain types of boats these compartments are usually raised above the level of the deck. From the bow of the boat a trough-shaped ladder, made of plate and angle steel, rises at an angle of 45 deg. to a height of about 63 ft. above the water level. The ladder is connected with the sides of the hold by girders. On top of a receiver placed at the end of the ladder, a small pivoting crane is fixed which supports the telescopic discharge chutes in such a manner that they can turn in any direction.

Along the entire bottom of the hold runs a tunnel, the upstanding sides of which are provided with a number of sliding doors. On the bottom of the tunnel travels the conveyor, driven by either or both of the compound engines in the engine room. Through the tunnel and the bow of the vessel the conveyor moves to the ladder in which it travels to the discharge tumbler located above the receiver, and returns empty to the engine rooms.

METHOD OF OPERATING

When the hold of the coaling vessel is filled it moves alongside the steamer to be loaded. A steam-winch sets the crane on the receiver in motion and the telescopic discharge chute is given the desired direction and inclination as well as the requisite length, placing the chute immediately above or into the bunkering hatch. When all is in readiness the engine is started and the tunnelman admits coal to the conveyor. This is done by means of a very simple system of leverage and by watching the conveyor the tunnelman is able to regulate the flow of coal. A clinometer in the tunnel shows the list of the ship from time to time.

The levers which control the flow of the coal on the conveyor are such that a single pressure downward will imme-

diately close the door. It is necessary to do this sometimes to prevent the conveyor from being overloaded by a rush of fine coal following the admission of lump. The loaded conveyor before reaching the ladder, passes over a weighing machine which adds automatically. When the bunker has been filled and it is necessary to shift the discharge chute to another hatch, the conveyor is stopped and the boat transferred to the new position either by a tug or by its own power. While actually bunkering it only needs a fireman, an engineer and a tunnelman, and further, no trimming is required on the barge as the coal glides down of its own weight.

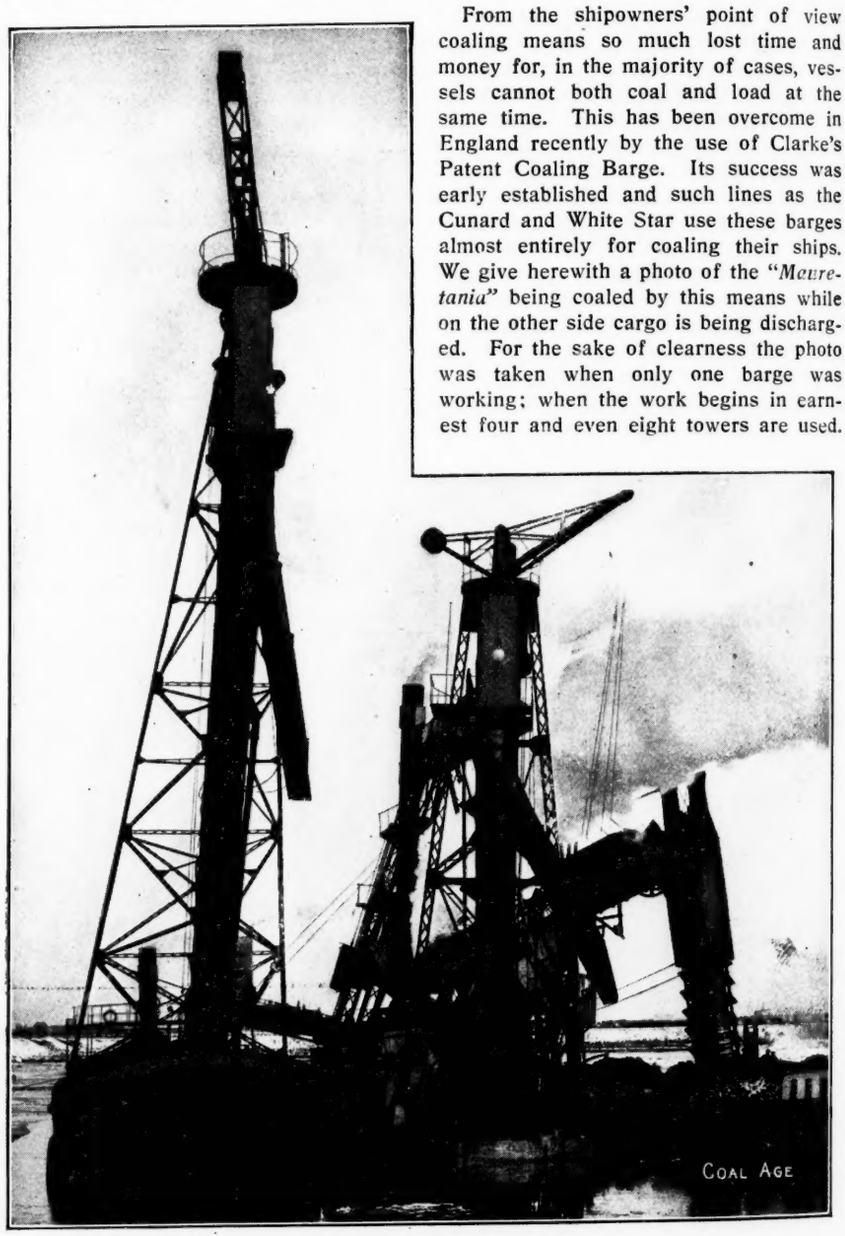
It is impracticable to give a detailed description of the vessels here, but the accompanying photos will help the reader to understand the construction of the apparatus. The coaling vessel "Harpen" is one of the most modern and was only constructed last year. It has a total hold capacity of 1000 tons and an electrically-driven transporter replenishes the coal from a lighter alongside as quickly as she supplies it to a steamer. The transporter is mounted on four supports which run along the entire length of the boat, and the telescopic parts may be used on either side of the vessel.

The Bunkering Elevator

The bunkering elevator is subsequent in construction to the coaling vessels already described and differs from these in design as well as the purpose for which it has been built. It is intended to take the coal out of the hold of barges alongside and discharge it into the bunkers of steamers, the hold of coaling vessels or deposit it into railway cars on the dock. As it is required to carry no coal, but merely to take it out of barges, this apparatus has no hold but is erected on a strong pontoon which easily bears the heavy weight of the structure.

The coal is taken out of the barges by means of a swinging ladder,—on the right of the photo,—suspended at the end of a movable bearing arm and fitted with a double row of buckets. As shown in the illustration this bearing arm is lowered until the buckets, which have been set in motion, reach the coal in the barge's hold and fill themselves. The buckets then go up the swinging ladder where they reach the bearing arm. The direction of the buckets here changes from the vertical to the horizontal so that they empty their contents into a channel which has nearly the same cross section as the buckets. In this channel the coal is pushed forward by the buckets, until it reaches the end and glides into a fixed receiver, and the buckets, now empty, run back to the swinging ladder along the upper side of the bearing arm.

Once the coal is in the receiver it can turn two different ways. When it has to be discharged into the hold of a vessel, or simply deposited on shore, it glides from the fixed receiver on to an endless conveyor, which is kept in a nearly horizontal position. The illustration given with this article shows the elevator engaged in transshipping coal from a lighter into the hold of one of the coaling vessels. Instead of discharging the coal in the way just referred to the elevator can load directly into a steamer's bunkers and for this purpose the apparatus is provided with a ladder and telescopic chute and works in the same manner as an ordinary barge. This apparatus is capable of dealing with quite 500 tons of coal an hour and can be made self-propelling.



An Elevator Loader Transhipping from Lighter to a Steamer's Hold. Capacity, 500 Tons per Hour

The bucket elevator for coaling ships in docks and in harbor has already been constructed in many types, but the continental ports have all adopted the movable or floating type of coaling vessel. The English ports, on the other hand, with one or two exceptions have kept to the old style of stationary hoist worked by hydraulic or steam power, though the electric conveyor belt is rapidly superseding these at many British ports.

Clarke's Coaling Barge

From the shipowners' point of view coaling means so much lost time and money for, in the majority of cases, vessels cannot both coal and load at the same time. This has been overcome in England recently by the use of Clarke's Patent Coaling Barge. Its success was early established and such lines as the Cunard and White Star use these barges almost entirely for coaling their ships. We give herewith a photo of the "*Mauretania*" being coaled by this means while on the other side cargo is being discharged. For the sake of clearness the photo was taken when only one barge was working; when the work begins in earnest four and even eight towers are used.

These barges feed the buckets with coal which has been tipped into their holds. The barges are fitted with false bottoms through which bucket elevators pass, enabling the coal to drop into them through sliding doors. The coal is then carried by the buckets to the tower where, after being weighed, it drops down into tubes and so passes to the bunkers of the ship by gravitation. Each of these barges

holds about 100 tons and, if this supply is constantly replenished from coal barges alongside, over 300 tons of coal per hour can be loaded. The whole operation is practically dustless and can be accomplished while the vessel is loading or discharging cargo.

Time is not the only saving entailed by the use of these barges. The mere saving to paintwork alone is worthy of consideration and there is also a great advantage in the ease with which the precise quantity required can be adjusted. Moreover, more economy is effected in the saving of labor and lost time on the vessel.

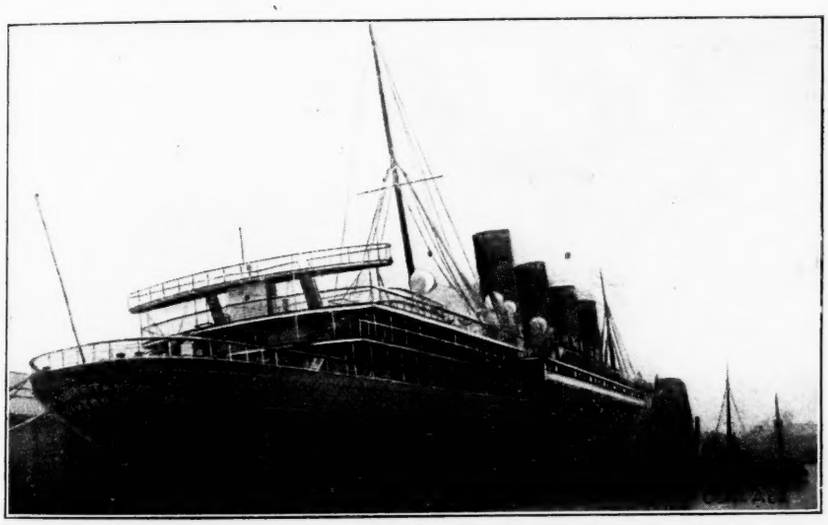
The Barry Crane

Although the Barry Transport Crane is not exactly a new addition to the list of appliances for the handling of coal it is a unique combination crane, suitable for dealing with loads up to 1½ tons at an outreach of 45 ft. from the center line of the track. It is particularly useful in the rapid discharge of coal either from steamer to quay or from one portion of a quay to another and it is so proportioned as to give ample stability under all working conditions.

It has a clear height of 40 ft. from the rail lever and the cantilever boom is hinged at a point 12 ft. 8 in. from the center line of the machine, so that the boom can be lifted up to clear shipping coming alongside the quay. The machinery is fixed in cantilevers at the back end of the tower and consists of gearing for lifting the load, raising the front portion of the boom and also for raising the hinged platform at the base of the machine. Independent barrels are provided for hoisting the hinges, beam and platform and driving rope pulleys for the lifting and traversing movements.

The whole of the machine runs on eight cast steel wheels, four on each sill. The maximum speed of the machine is for lifting, up to 200 ft. per minute and for racking up to 1200 ft. per minute. The electric motor used for running the whole apparatus is of 25 b.hp., of the enclosed ventilated type, suitable for three-phase current, 66 cycles, 200 volts complete with reversible controller and metallic resistance. A switch with fuses, pilot lamp, etc., is provided in the driver's cabin.

The framing of the conveyor is built up of rolled steel sections, rigidly braced together to give ample stiffness and the materials and workmanship employed are the best of their kind. All shafts are of steel, accurately machined where necessary, and bearings and pulleys are bushed with gunmetal and have efficient means of lubrication.



Coaling the Liner "Mauretania"

A New Barge at Holyhead

An automatic coaling barge, has recently been installed at Holyhead, which possesses several new features. It is about 155 ft. long with 27-ft. beam. Down each side runs a line of nine coal pockets each holding about 25 tons of coal, and communicating with a central well 20 ft. deep and 4 ft. 6 in. wide. Over this are two elevators on 6-wheel carriages, each elevator having 58 buckets 3 ft. wide, spaced every 18 in. The elevator is adjusted with its lower end to the door of one of the pockets, which is then opened by means of a hand-winch, and the coal flows out into the boot of the elevator ready for raising by the buckets.

When used for coaling vessels with side bunkers a steel shoot is fitted to the top of each elevator into which the buckets discharge the coal; these shoots are so arranged that both may be used on one or two vessels, one on either side of the barge. If, however, the vessels to be coaled have to be fed through hatchways in the deck, these shoots are removed and replaced by a conveyor supported on a carriage on the same rails as the elevator. This conveyor is so designed that it can be turned completely round, moved fore and aft, and raised or lowered, and is capable of being turned upwards for 18 deg. and downwards for 30 deg.

The coaling speed of the barge is 300 tons per hour, and an absence of dust is obtained by feeding the exhaust steam from the engines on the elevator into the coal; these obtain their steam through flexible pipes from the engine room in the stern, where is situated the donkey engine which travels the elevators by means of a chain lead.

Briquetting Coal Dust

By Robert Grimshaw*

Prof. Le Maître has made tests of the heating power of briquettes of Belgium and Croatian coal dust, using as bond a new naphtha derivative, instead of the usual tar compound; the result was an increase in the heat value of the briquettes. The process is as follows:

Crude tallow is treated with nitric acid, the mass poured into soda lye, mixed with lime and heavy mineral oil, placed in a Papin's digester and boiled. The product is like pitch, has a specific gravity of 0.95, and melts at a temperature of between 176° and 194° F.; it burns at 482° to 572° F.

As a bond for coal dust, 8% to 10% of the weight of the fuel is necessary. Besides coal, other combustible materials may be used. The results of the tests are shown in the accompanying table:

Results of Tests of Briquettes

Kind of Coal		Calorific Value	Proximate Analysis		
			Volatile Matter	Fixed Carbon	Ash
Fatty Liege	Lump	14,700	18.00	72.00	10.00
	Briquette	15,600	28.68	62.92	8.40
Croation Lignite	Lump	9,000	38.80	41.60	19.60
	Briquette	10,600	41.50	38.50	20.00

For the starting of a coal-dust explosion two conditions are necessary: (1) a disturbance sufficient to suspend a cloud of fine dust in the air and (2) the projection of flame into this cloud of dust. An explosion once initiated in this way will extend indefinitely along dusty roadways in a coal mine, stirring up the necessary dust cloud in front of it, and only ceasing to burn where there is insufficient fine dust on the roof, timbers, sides and floor of the road to furnish this dust cloud. Precautions in regard to safety lamps, ventilation, shot-firing, etc., have accomplished much in coal mines but the solution of the coal-dust problem still demands the attention of experts.

*Dresden-A. 16, Germany.

The Varta Electric Mine Lamp

It has been definitely established that the breakage of an ordinary incandescent lamp in a gaseous atmosphere may ignite the firedamp. As a result of this condition numerous special designs have been devised for the purpose of overcoming this trouble. The one here described appears to have successfully passed the most rigid tests.

In COAL AGE, Vol. 1, p. 478, there was a translation of an article on this subject, taken from the *Annales des Mines de Belgique*. The COAL AGE translation appeared later in *Zeitschrift des Zentral-Verbandes der Bergbau-Betriebsleiter* and elicited the following discussion by J. Hertens:

In No. 8 of this journal (the *Zeitschrift*), the present year, I find under the above title an article on the possibility of igniting firedamp by incandescent filaments. This article, chiefly a theoretical investigation, will be of greater interest when modified by a few notes originating in practice.

The paper referred to concluded with the statement that the breakage of a bulb of an incandescent lamp having a carbon or metal filament in a gassy mine must be regarded as dangerous. On one hand, a high temperature of the filament must be considered an unfavorable condition in a gaseous atmosphere, while on the other hand, a high temperature is desirable on account of its superior illumination, but it is essential to provide against the danger that may result from breakage of the bulb.

These statements are undoubtedly correct. Yet the discussion of this question must lose considerable of its importance if there do exist lamps which provide adequate measures against an explosion of firedamp. An example of this type is the Varta lamp, in which quite a simple device affords the needed protection. The bulb is surrounded by a glass globe, the walls of which are so strong that, if shattered, it must result in a smashing of the incandescent lamp also.

It may be objected that there is the possibility of a dangerous temperature at the contact places where the metal filament, that is destroyed by the breakage, is connected. In this lamp, however, the platinum wires holding the metal filament are so short that after breaking off the filament no contact between them is possible and thus sparking is entirely prevented.

DESCRIPTION OF THE LAMP

The lamp consists essentially of the casing pot, the upper part of the casing with incandescent lamp mounted in it and the storage battery.

The casing pot, 7 in. high, is set in the storage battery, which has a circular cross-section and is made of seamless sheet steel, 0.04 in. thick. The outer diameter is 3¼ in., while at the foot and at the upper widening, on which the top part of the casing is set, it is 3½ in. in diameter.

The upper part of the casing is removable and also consists of sheet steel 0.04 in. thick. In closing the lamp it telescopes over the casing pot, covering it for about 1⅜ in. On the inner wall of the upper part are three guide cams, which slide in corresponding guide grooves in the casing pot. To protect the glass globe and the incandescent bulb against injury, the upper part of the casing is provided with a disk-shaped cover, which is held by five strong iron rods. To this cover is attached a ring with the hook for carrying the lamp.

The incandescent bulb with fixture, reflector and contacts, is mounted on a special insulating plate, which, after the insertion of the glass guard globe, is held fast by a threading in the upper part of the casing. This presses the lower edge of the glass globe against an abutment ring. Between this ring and the glass edge, as well as between the glass and insulating plate, is placed a tight soft-rubber ring. The lamp is provided with a magnetic closure. This is also placed in the upper part of the casing and consists essentially of a rectangular pin pressed by a strong spiral spring and mounted on an iron body. In closing the lamp, this pin springs behind a lug in the casing pot.

The storage battery is constructed as a round shell, but with flat plates and a casing made of celluloid. Electrical connection and disconnection are made by turning the upper part of the casing. For filling with acid, a hole is provided in the cover of the celluloid vessel with a small threaded tube 0.32 in. diameter, set in it, and closed by a celluloid screw with packing. The escape of acid, by upsetting of the lamp, is prevented by an intermediate chamber above the battery plates, in which lies a gas-relief tube.

The incandescent bulb consists of a small osmium filament lamp of 2 volts and 1.5 cp. The platinum wires which hold the metal filament, project only 0.04 to 0.08 in. from the glass socket, and are placed so far apart that in case of any breakage they cannot be brought into contact with each other.

The height of the lamp, including the carrying ring, is 11¼ in. The height of the guard glass (free glass surface) is 2¼ in. and the outside diameter is a little more than 2 in. The lamp ready for use weighs about 5½ lb. and the storage battery about 3 lb.

TESTING IN FIREDAMP

The construction of this lamp answers to the conditions which are to be imposed on electrical lamps for use in gaseous mines. The storage battery and its pole connections, the contacts, the fixture of the incandescent bulb and all other parts conducting an electric current, lie inside of the casing, which is strongly and substantially made.

The incandescent bulb is surrounded with a thick glass globe and thus protected against improper handling. This globe is so set in the lamp that it cannot be loosened and removed from the outside. An unauthorized opening of the lamp is prevented by the magnetic lock, which is strong and efficient. There are no openings in the closed casing, and thus all parts conducting an electric current are inaccessible during service. The contracts by which the current is connected and disconnected with the lamp are so proportioned and insulated that they cannot cause a direct connection of the poles of the storage battery, and hence a short circuit.

All things considered, there is no danger that any part of the lamp can, through either accident or carelessness produce outside sparks or heat effects, whereby firedamp might be ignited. The tests of the lamp for safety were required to cover its behavior in firedamp under two conditions: In ordinary service and in any destruction of essential parts.

In using the lamp under ordinary working conditions, the heating effects of the current, which might inflame combustible materials, are confined to the incandescence of the metal filament in the bulb itself. The possibility of sparking lies only in connecting and disconnecting of the current supplying the bulb.

The source of current for the lamp consists of a single lead cell, storage battery with a working tension of two volts, while the incandescent bulb is proportioned for 1.5 cp. The sparking produced when disconnecting is easily observed and is extraordinarily small; trials made have shown that the firedamp could not thus be ignited. Moreover, the contact places at which these sparks can only occur, are placed inside of the lamp and are thus not directly exposed to access of firedamp.

TESTS FOR BREAKAGE

In mine service a forcible breakage of the lamp, as, for instance, by fall of rock

or by a knock with a miner's pick, are not out of the question. If, in such event, the incandescent bulb remains uninjured, the damage suffered can cause no danger. In earlier tests it was determined that sparks, capable of igniting gas, could not occur when the storage battery of an electric lamp was completely broken. The short-circuiting sparks, which might thereby be produced, and which in themselves would be very small, are immediately destroyed by the acid.

The most sensitive part of a lamp is the incandescent bulb. When the white-hot metal filament inside of it comes in contact with firedamp, an ignition of the mixture is sure to occur; in order to prevent this the bulb is inclosed in a glass globe 2⅜ to 2¾ in. thick. To determine whether this protection is adequate, the following tests were made:

The lamp was placed in the testing gallery filled with firedamp. Repeated trials were then made to prove that when the incandescent bulb was broken with a pointed tool, the glowing metal filament would remain undamaged. In order, however, to break through the thick protective glass, it was necessary to exert such force that the metal filament was destroyed. Thus the lamp was extinguished before it had a chance to come into contact with the firedamp.

Because of the arrangement of the platinum wire carrying the metal filament, as already described, it was also found impossible to press the now exposed wires together, and thus heat them up. Therefore the lamp may pass as safe against firedamp, even in case of a possible destruction of the essential parts.

The storage battery showed itself during the test to be strong and durable. Also after long service the pole connections have not shown corrosion. The lighting strength of the lamp is taken at 1.5 cp.; the length of time it will burn is ten to eleven hours before it is necessary to renew the battery.

A New Coal Transportation Plant

German Correspondence

The problem to be solved in the construction of this plant was to unload the procession of coal barges without delay, carry the coal from the river to the storage yard and stack it 26 ft. high, without interfering with the traffic on the streets.

On the bank of the river Spree, near the municipal electric plant in Charlottenburg, there is an extensive coal transportation system which is in some respects rather remarkable.

The special problem to solve was to unload coal and carry it from barges over a lower loading street and an upper general traffic street and stack it about 26 ft. high. Solution was rendered more difficult by the necessity of not blocking traffic on those two streets. A speed of 50 gross tons an hour was demanded, to be increased, if desired, to 100, in order that even large canal boats could get away rapidly.

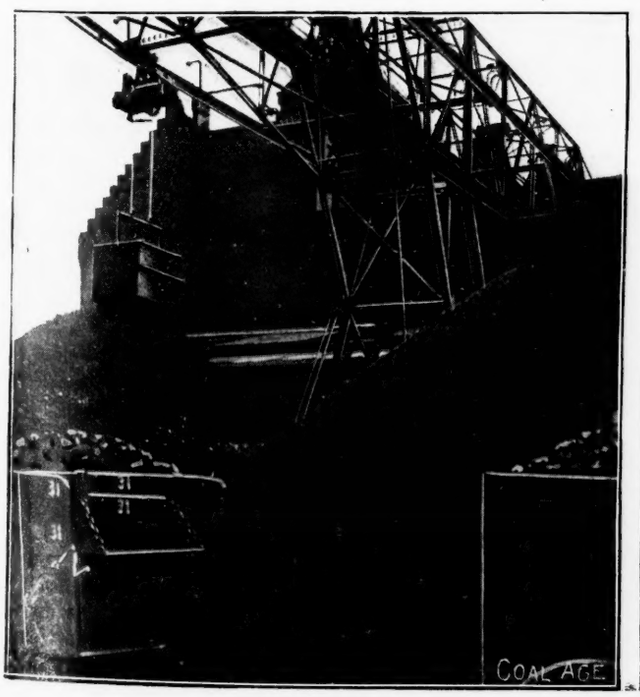
It was further required of the plant that it should be able to take the already stored coal from any part of the storage grounds and move it to any other part. This was called for with regard to the possibility of fire in the heaps; but it would also enable the coal to be taken from the storage ground and loaded in barges, if desired.

The problem was solved by Government Engineer Karl Bernhard, of Berlin; the suspension railway designed and delivered by Adolf Bleichert & Co., of Leipzig.

General Construction

The system consists of four principal parts: a front crane, mounted on trestles, which are movable parallel to the river, a cross-bridge over the upper street to the storing ground, a stationary main bridge reaching entirely over this latter, which is 574 ft. deep (these three members forming a T), and two movable transverse bridges or overhead cranes above the latter.

One of these movable bridges has a 118-ft. span, and the other 138 ft. The larger of the two has also a boom 52.5 ft. long. Each bridge has an operator's cab, containing all necessary electric switches, controllers and resistances, and can travel 65.6 ft. a minute.

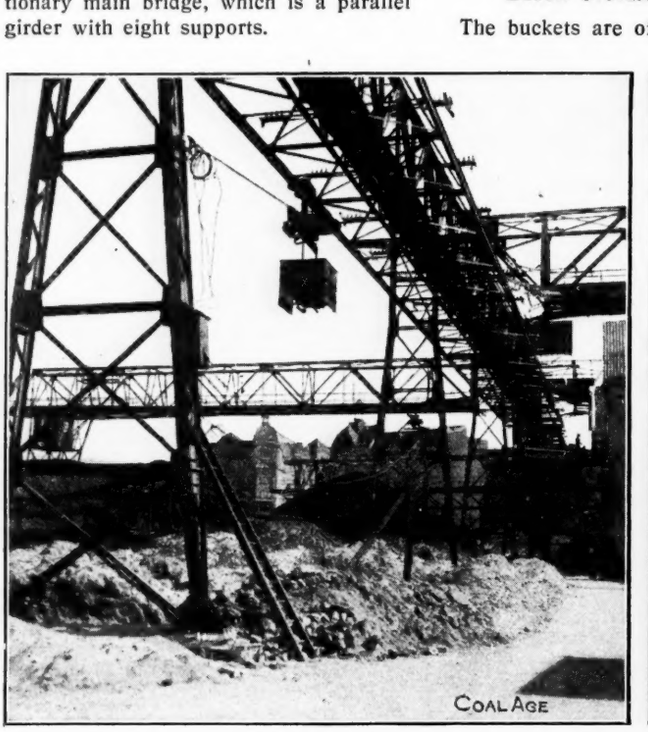


Storage Yard

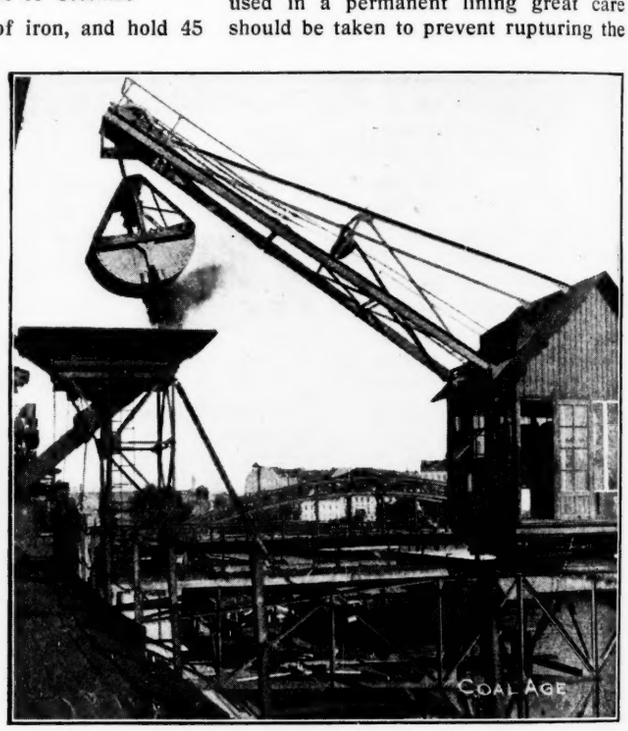
Hopper at Unloading Station

The trestle carrying the electric swing crane runs on a rail anchored in the river wall, and is guided above by the front bridge running parallel to the river bank. Its adjustability up and down stream permits getting coal out of every part of a moored barge, without shifting the latter.

The front bridge is interesting on account of the originality of its support; it not being permissible to carry it, as usual, on a row of two-legged trestles or stiff frames. Bernhard has set his bridge on single legs, anchored in a concrete foundation, leaving the street free, as these lie in the supporting wall between the two streets. From this bridge there is an arch across the street to the stationary main bridge, which is a parallel girder with eight supports.



CARRYING THE COAL



UNLOADING STATION

The fourth portion of the plant, the transverse secondary bridges, run above on the main longitudinal girder and below on iron guide rails bordering the coal ground.

HANDLING THE COAL

The grab bucket of the electric crane takes the coal out of the barge and deposits it in a hopper, in front, on the trestle. From here it is carried in little electric suspension cars, six in number, across the transverse bridge over the traffic street, to the arch bridge; hence to the storage ground, and there, according to the position of the subsidiary trestles, automatically dumped.

The height of the trolley track is such that the coal can be readily taken from the barges and loaded into the buckets of the electric overhead cars. The empty cars cross the subsidiary bridges and traversing the main bridge, approach the hopper again by a loop, from the other side of the front bridge.

Each trolley car has an automatic electric lowering and raising device, by which the full bucket is lowered at the dumping place, in order not to drop the load far.

The trolleys have the Bleichert patent automatic drive. Each one consists of a two-wheeled running gear with cast-steel wheels, and a double-pulley rope hoist with own gear. The drive is effected by a traveling motor, the hoisting by a second motor, used for this purpose only. For driving the cars a current of 220 volts is used.

BLOCK SYSTEM OF SIGNALS

The buckets are of iron, and hold 45 cu.ft. each; they have lateral discharge doors which can be opened automatically. The empty cars stop automatically on the loading track, and when loaded are started on their way, from the cab. From then on, their movements are automatic, and they are run on the block system.

This system is worked on the principle that the overhead track is divided into sections of equal length, each having at one end a switch which is worked by the cars as they pass it; each car cutting out the section which it has left, and cutting it in again only when it is on the next section, so that back of each car there is a dead section of track, on which no car can run.

The track switches are automatically locked in position by an electric switch that throws the track tongue and cuts out a section of the track, thereby stopping the next car following.

Only two men are required to operate this system—one at the loading station and one at the dumping place. The cars all travel continuously and at equal distances apart, remaining separated at this distance until wanted. There is a small iron house for shunted-out unnecessary cars.

Steel Mine Timbers

The use of iron and steel in place of mine-timbering has increased rapidly during the last few years. It gives good results as props at the coal face or as girders or bars where the pressure is great or in return airways where timber decays rapidly. Where iron girders are used in a permanent lining great care should be taken to prevent rupturing the masonry and bending the girders. Lay pine planks 3 in. thick and 12 in. wide along the top of the side walls, place the girders on them. Each girder must be absolutely straight with webs at right angles with the line of the roof and with ends clear of the ground or stone on either side. The side-walls should be from 2 to 5 ft. thick. Quick-setting mortar should be used and should be well set before the girders are put in position.

A "self-rescue" apparatus has been recently placed on the English markets. It is intended to be kept below ground ready for use by miners threatened by fire or bad air. Encased in this apparatus the miner could live for at least one-half hour, which would allow him to make his escape to some ventilated part of the mine.

West Virginia's Labor Troubles

By Neil Robinson*

Paint Creek and Cabin Creek are the opening battle ground for a strike proposed for every section of West Virginia. The labor leaders propose attacking only one section at a time. The author denies that the cost of coal in West Virginia is low and says that the strike is aided and abetted by Pennsylvania operators, in order that they may possess themselves of the markets of their rivals.

*Secretary, West Virginia Mining Association, Charleston, W. Va.

Under the caption "West Virginia on the Brink of a Labor Struggle," the *Black Diamond*, of Chicago, has printed an interesting article from which the following extracts are taken:

"Labor trouble on a large scale has again broken out in West Virginia, and this time the statement is made that peace will not be restored until the mines of that state are wholly union or non-union. The trouble so far is confined to the Paint Creek and Cabin Creek districts, but present indications are that it will, in the near future, extend first to the New River and then into the Pocahontas district.

"With the assurances that any such a widening of the strike zone would also include the Kanawha field, it seems likely that the trouble will embrace the whole state. In that event, which is now expected, the lines will be sharply drawn between unionism and non-unionism with a decisive contest inevitable.

Broke the Union in the Effort to Consolidate It

"To understand the seriousness of the present extraordinarily aggravated situation, it is necessary to go back a matter of ten years into the history of West Virginia coal mining. Prior to 1902 the United Mine Workers of America had a strong foothold in almost all the districts of West Virginia.

"The state was never so completely organized as are, for instance Illinois and Indiana, but was in a position to be fully unionized should the right kind of action be taken. The union officials evidently feeling that the needed plan might be the calling of a strike, upon a very slim pretext ordered all union miners to quit work.

"It has, at various times, been hinted even by the miners' leaders that the purpose of this strike was solely to solidify sentiment in favor of the union and thus perfect the organization.

"If that was the hope of the leaders the result was diametrically opposite. The mine owners, seeing a strike called, unprovoked and without justification, decided that they did not care to have their business dominated by that kind of a force. To prevent it they decided to wipe out the union. The efforts were so successful that never since that time has the union had a toehold in West Virginia, except in the Splint coal district, and that section was only partially organized.

A Fight Between Operators as Much as a Labor War

"It was not altogether the antipathy to the union which animated the operators in deciding to antagonize the closed shop. In every labor convention since 1902, in the States of Ohio, and western Pennsylvania, the operators of those states have declared to their miners that no advance could possibly be paid so long as the West Virginia coal was produced at a far lower cost than was the coal of western Pennsylvania and Ohio.

"In other words, West Virginia's northern neighbors had continuous regard for West Virginia's competition in making up their own wage scales. It happens that West Virginia operators have a turn for logic themselves and have stated the situation with remarkable clarity.

"They have stated that if the unionizing of West Virginia mines would help to broaden the market for Ohio and western Pennsylvania coal, this same unionizing would be a bad thing for West Virginia operators to consider or submit to because it would, by broadening their neighbors' markets, narrow their own.

"On two accounts, therefore, West Virginia operators have been opposed to the unionization of that field. The first reason was that the operators in that state did not want to be bound to a union which would call a strike on no provocation. The second cause was that the operators of West Virginia did not care to become a party to a labor or any other contract which presupposed the narrowing of their own markets.

"Those two considerations supply the animus on both sides; the miners desiring the better pay and the more favorable working conditions obtained through union affiliation, and the operators desiring freedom from the entangling alliance with the union, and seeking to preserve as broad a market as possible."

Every time an operator or a miner delegate from another state makes a public declaration of any kind he begins or ends with a statement that "the cost of production is less in West Virginia than elsewhere."

The operators in the Kanawha district, where the present fight is being made, say that their rivals are willfully misrepresenting the facts and they point out, as evidence therefor, the sworn testimony which was introduced a few months ago before the Interstate Commerce Commission in what are known as the Lake Rate Cases.

Cost of Mining Coal

In the suit against the P. & L. E. R.R., the General Manager of the Pittsburgh Coal Co. gave the production cost at fifty-two of their mines. This statement showed an average of 99.09c. per ton, run-of-mine, on board cars. This included labor, supplies, fuel, general office expense, depreciation and royalty.

The testimony introduced by the Kanawha operators in the suit against the Chesapeake & Ohio and Kanawha & Michigan R.R. showed the cost of Splint coal, run-of-mine, on board cars as 99.11c. per ton. These figures do not include interest on capital, losses from underground faults, fires and floods, lost operating time, strikes and lockouts and litigation.

The summer business for the southern West Virginia mines consists largely of the shipments which are made to lake ports for transshipment by water to Duluth, Milwaukee and other points in the Northwest. The vessel rate is the same whether the coal comes from Pittsburgh, Kanawha or Thacker, but in the rail rates there is a difference of 19c. per ton, or almost 25 per cent. Pittsburgh can ship to Ashtabula and Cleveland on a rate of 78c. per ton, while Kanawha must pay 97c. The vessel loading charge of 5c. per ton is the same at all ports.

West Virginia Mines Not an Economic Blunder

A high official in the largest coal company of the Pittsburgh district has declared that the opening of the West Virginia mines was an "economic blunder." In other words, it is charged we are a mistake and have no right to an existence—and it is therefore legitimate for our rivals to drive us out of business if they can. The means selected for the accomplishment of this purpose are two fold: first, the pressure on the northern railroads to force exorbitant freight differentials against us; second, the coercion of the miners' union to impose labor troubles of such magnitude that our mines cannot be operated successfully.

The demands upon the railroads were formulated by the Pittsburgh shippers in January and February, 1909, and first took the form of a proposed increase of West Virginia rates under pressure by the Northern railroads, which was suc-

cessfully resisted in the courts and before the Interstate Commerce Commission. Then the Pittsburgh operators instituted Interstate Commerce proceedings and they were pressed vigorously until March, 1912, when the Interstate Commerce Commission handed down a decision lowering the Pittsburgh freight rate to the lakes from 88c. to 78c., while our rate was maintained at 97c. per ton.

Mr. Taylor Acknowledges that He Desires to Recover Lost Trade

On Nov. 24, 1911, M. H. Taylor, chairman of the board of directors of the Pittsburgh Coal Co., appeared as a witness in this suit and the following questions and answers were taken from the official record:

Question—To Mr. Taylor. "If any change is made in the freight rate, which will result in increasing your output, that must necessarily result in a corresponding reduction of the output in the competitor's (W. Va.) field?

Answer—"That is correct.

Question—"And that is what you desire to accomplish?

Answer—"That is exactly what we desire to accomplish."

The shipments to the lakes during the summer season of 1911 from the Kanawha district amounted to about 3,000,000 tons on which we paid 9c. per ton excess freight over the Pittsburgh rate, amounting to $270,000.

This year Pittsburgh has 19c. per ton advantage over us and the extra cost on the tonnage for 1911, if shipped in 1912 would amount to $570,000.

The difference between the two years on the same volume of business amounts to $300,000 and is directly chargeable to the Pittsburgh operators who framed the demands upon the railroads and went before the Interstate Commerce Commission for the express purpose of increasing the freight differential against us.

The Pennsylvania and Ohio Operators Would Shut Down West Virginia

But the steady year in and year out attack by Pennsylvania and Ohio operators on the West Virginia mining industry has been thorough and attempts have been made to make it effective with the help of the miners' union. They have proceeded on the sound theory that if West Virginia were unionized the weight of miners delegates from Pennsylvania, Ohio, Indiana and Illinois could vote such conditions upon us that scores of our mines would be compelled to shut down.

The efforts of the Pittsburgh and Ohio operators to stir the union into action have been continuous for a number of years. At every wage conference the operators have openly demanded that West Virginia should be organized—and the miners have been played as so many pawns in the game.

Since the present trouble began, William Green, statistician and personal representative of John P. White, President of the United Mine Workers, has been in conference with an official of the biggest mining company in Pittsburgh and other operators, promising to shut down Paint Creek and Cabin Creek and then New River and Fairmont and gradually tie up the state, and he has been urged to continue the work.

The Cause Assigned for Present Troubles

The reasons assigned for the present trouble are merely pretexts. The union offered to accept the old scale if given the "check off." The guard question is not a real issue, as there never was a single guard at the Paint Creek mines until armed rioters commenced their disturbances and only four guards were employed on Cabin Creek where about 3000 men were on the payrolls.

Any other pretext would have served the purpose just as well as those quoted. Pennsylvania and Ohio operators are stirring the union to action and the union is sending men and money into the Kanawha Valley to foment trouble and keep the mines idle. It is an operators' battle and the miners are being used as tools by the operators in competitive states.

Our cost of production in Kanawha is not appreciably lower than in Pitsburgh; the wage question could have been traded for the check-off; and the guard question is a trumped-up issue. These declarations being true, what is there left to prolong the trouble except the selfish efforts of rival states to dominate us through a powerful union?

Are our state officials, our mine employes, our business men, the state unions in other industries and our citizens generally in favor of West Virginia or do they wish to see their home mines crippled and coal contracts sent to other states, the sales of jobbers and retail merchants cut down and unnecessary suffering caused to hundreds of carpenters, masons, farmers and others who are dependent upon the mines for support?

West Virginia to be Attacked in Detail

Outside operators, as stated, have discussed the union plans in detail with union leaders and urge that they shall be carried out. Kanawha is to be conquered if possible. Then the invading forces from other states will move in strength on New River, then Fairmont and from there to the Norfolk & Western territory.

West Virginia is to be attacked in detail. It is no secret. National organizers are to start trouble successively in every district—and the Chicago writer stated the case correctly when he predicted that "peace will not be restored until the mines of that state (West Virginia) are wholly union or non-union."

Paint Creek is simply an incident—the opening skirmish—in the general plan of battle. Public sentiment could not be a factor in the freight-rate cases, but it may be potential within our own borders.

51,769 men were on the payrolls in 1906
4,496 new men entered in 1907
4,132 new men entered in 1908
1,792 new men entered in 1909
5,946 new men entered in 1910
2,509 new men entered in 1911
70,644 men are employed in 1911

Shall this army of men and the 424 companies employing them continue their work in peace or shall the state open its doors to organizers from rival states and countenance speakers who demand—as they have done publicly—that non-union men shall cease work or face the penalty of death?

Paint Creek Mining Situation

Twelve operations are involved in the Paint Creek disturbance. These mines occupy a frontage of about twelve miles on the Paint Creek branch of the Chesapeake and Ohio R.R.

The last report published by the State Mine Inspector, covering the year ending June 30, 1911, shows that at that time 962 men were employed who produced during the year 977,856 tons of 2000 lb. each.

That the relations existing between the miners and operators were harmonious is illustrated by the fact that the Commissioner for the Kanawha operators was only called once in two years to adjudicate a difference with the men.

Working Conditions Not Bad

Mining conditions are generally good—eight of the mines having a seam thickness of 5 ft. to 7 ft. 6 in. A thrifty miner at one plant has been able in a period of seven years to accumulate over $4,000, which is now deposited in a savings bank, and several hundred men had savings accounts of smaller amounts.

As an illustration of the fair earnings received, we will cite a few averages taken from the pay rolls.

Mine A. Running time, 16 days in one month; 25 miners earned $2177.90;

Note—Letter to public published by the West Virginia Mining Association, Charleston, W. Va.

average, $87.12; 4 machine men, $390.-55; average, $97.64.

Mine B. Running time, 16 days in one month; 24 miners earned $2118.93; average, $88.29; 4 machine men, $390.-55; average, $97.64.

Mine C. Running time, 14 days in one month; 25 miners earned $2218.55; average, $88.74.

The earnings of eleven men who worked in the same places in a mine for a period of five consecutive months, averaged $87.62 per month.

Preliminary Negotiations

On Apr. 1, the wage agreements with the men expired by time limitation but work was continued, pending an adjustment of a new scale, until April 19 when work at all the Union mines in the Kanawha district was stopped. Negotiations were re-opened about May 1 and concluded a few days later when the whole district signed a new scale except the Paint Creek mines. These companies offered their employees a renewal of the old scale and working conditions, which was refused.

National representatives of the Mine Workers Union had offered to contract at the old scale provided they were given what is called a "check-off." This means that the companies would be compelled to collect Union dues and initiation fees from every man on the pay roll whether a member of the union or not—and these dues must be charged after house rent and the doctor's stipend have been deducted, giving the collections of the union priority over those for food or household necessities.

About 10 per cent. of the men belonged to the union but the check-off was demanded for the entire force. The Paint Creek operators refused to enter into an agreement of this character and this ended the negotiations. Mining was resumed at the Imperial mines May 12; at Greenbrier and Grose in June and at Standard and Wacomah in the early part of July.

Men Could Have Moved Elsewhere

In this connection it is to be noted that there has been, during the whole of the present year, and there now is, a shortage of labor in the Kanawha Coal District as well as elsewhere in the state, and that more than twice as many men as were employed on Paint Creek Apr. 19 could have found and can now find, within 24 hr., work at mines in the district operating under contracts with the Union Mine Workers and paying the union scale. So that all men who did not wish to work on Paint Creek could have gotten work elsewhere under satisfactory conditions with practically no loss of time.

The men occupying company houses who did not care to work were given due notice to move elsewhere, that the companies might have their own houses for the use of their own men. In connection with these notices the companies made the following offers:

A. To inventory, move and load the household property on board railroad cars; to prepay the freight on the same to any designated station in the Kanawha or New River district, and to buy the railroad tickets to any point in either district for the head of the household and each member of his family.

B. Or, to inventory, warehouse and take care of the property for a reasonable length of time and then to carry out the conditions recited in paragraph A.

Officials of the U. M. W. urged them to refuse these offers and hold possession of the property. Many of the men moved and got work elsewhere. Where the advice of the union officials was followed the companies were compelled to put the goods out of the houses, but in every instance orders were given to the officers to postpone the removal in all cases where illness or approaching maternity might make it inconvenient.

The Purchase of Rifles

Long before the closing of the conferences in regard to a new contract, miners in portions of the Kanawha district commenced to buy guns, principally army rifles, and many men became armed in March and April. During April, men with weapons met every train to threaten any workmen or special officers who might arrive. Finally, the danger from these lawless gangs became so great that the operators were compelled, for the protection of their men and property, to engage the services of special officers.

These officers are men who were selected after careful investigation. They are men of good repute, sober and trustworthy—and many of them are under heavy bonds. The men working for the companies do not object to this protection and all complaint has come from outside sources.

Chronology of Strike

It is well at this time to consider the chronological sequence of the events referred to.

In March and April, guns were being imported, and in the latter month, armed men met the trains.

May 9. A mob of about 150 men, from 75 to 100 of whom were armed, formed at Hansford and marched up the Creek for the purpose of terrorizing the operators and those who were preparing to work for them.

May 23. Ten special officers arrived and twelve more came a few days later to guard twelve operations including seventeen mines which were located along the railroad line for a distance of twelve miles.

About this time scores of anonymous letters were sent to the workmen threatening them that they "would be hung on a bridge," "shot full of holes," etc.

Shooting Commences

About May 26 or 27 the disturbers went up on the side of the mountain at Mucklow and cleared away some underbrush to enable the gun men to have a clear line of vision from their proposed hiding place to the company buildings.

On the morning of May 29 while the special officers were going unarmed from their sleeping quarters to breakfast, the concealed mob on the mountain opened fire upon them. Judging from the number of rifle shells afterward found on the ground, about 300 shots were fired. This was a deliberate, carefully planned attempt at assassination—and it was also the opening of hostilities, the first overt act.

Following this attack a Gatling gun was brought in as a further measure of protection. It was fired experimentally by the instructor on the day of its arrival and was in service during the attacks made upon the property at a later date.

Ready for a Hanging Bee

The second attack by concealed men was made June 5 when one of their number, an Italian from the Boomer mines, some 15 miles distant, was killed. A number of arrests followed and many of these men were found to be carrying ropes cut in lengths of about ten feet, evidently for the purpose of hanging any one they might capture, and seven of these ropes were secured. Some of the men were also carrying dynamite.

July 18. A man named Bobbitt, bookkeeper for the Paint Creek Collieries, was walking along the open road with his wife and child when they were fired upon by a small mob in ambush on the mountain. Mr. Bobbitt was unarmed and unprotected but after a narrow escape he found shelter with his family behind a power house.

Shooting of Stringer

On July 25 two special officers, Phaupp and Stringer, while en route to the main line of the C. & O. Railroad on a railroad velocipede, passed through a crowd of armed agitators. The cycle was not stopped but after the riders had passed beyond the crowd the latter opened fire, shooting at the backs of the two officers. Stringer was killed instantly. Phaupp was badly wounded (and is still in a hospital) but he managed to crawl into some weeds by the track and afterward escaped.

The rescue party which came to recover the remains of Stringer was driven off. During the night some of the mob went to the body, stole a watch and money amounting to $100 and then with a savagery almost unheard of in this

country, smashed in the skull with a stone or club and then rolled the body over on its back, unfastened the clothing and exposed the person of the victim.

On the next day, July 26, the shooting at Mucklow followed, after which the troops came on the scene. During the previous night the mob had picketed the creek to prevent any person entering or leaving, and it was a group of these pickets which killed Stringer and wounded Phaupp.

Brutality and Savagery

At times as many as one thousand men, mostly armed, have marched up and down Paint Creek and roved the mountains, some seeking opportunities to damage property and persons, others to terrorize and intimidate law-abiding citizens who wanted to work.

Instances of vandalism in addition to those mentioned above have been the cutting of the telephone wires near Holly Grove at the time Stringer was killed; shooting into houses at various times and places, attempting to wreck the Scranton tipple by turning five mine cars loose at the top of the plane; and shooting into a car of miners being brought to the mines.

Savagery was illustrated by the disgraceful treatment of Stringer's body. Even though enclosed in a coffin it was not exempt from the malice of these men. The coffin case while awaiting shipment at East Bank was disfigured by such words as "Gone to H——. More to go," "D——d thugs," "D——d guards."

While Phaupp was escaping from the attack on July 25 his coat was lost, and found by the mob. A week ago this blood-stained coat was exhibited by a public speaker and the crowd was told that it was "the only guard's coat the speaker had ever seen that was trimmed to the speaker's notion." That coat was then hacked to pieces by men who wanted fragments of it as souvenirs. These they wore pinned on their coats.

A Local Strike under National Auspices

At the present time there are seven union officials in the district from the States of Iowa, Illinois, Ohio and Missouri and men from Michigan and Indiana have been in the field. The national officials are sending in about $5000 per week to support the men who are maintaining the disturbances.

The camp at Holly Grove contains not more than 75 former employees of the Paint Creek companies. The disturbances are caused by disorderly men who have come from various points all over the district. The operators have constructed over fourteen hundred buildings on the creek and they have total investments there amounting to at least $2,000,000 but this property is placed in jeopardy by the acts of agitators from other mines and other states.

The hope of the leaders has been to create a disturbance so extended as to compel the public officials and ourselves to surrender to the union. They have all to gain and nothing to lose by this policy; and just as long as there is a ray of hope that the public officials can be influenced to support the demands of the union, the rioting will be continued.

If these lawless men from our own and other states are supported in their demands, the mining industry of West Virginia will be so seriously injured that it may not recover for years, and we venture the assertion that there is not a mining district in the state which will not within three months be subject to disturbances of the same character.

Paint Creek Collieries Co.
Standard Splint & Gas Coal Co.
Imperial Colliery Co.

The Blyth, England, Harbor

British Correspondence

The Blyth harbor is one of the more modern of the British ports and in point of tonnage ranks sixth in importance. Coaling facilities include the most up-to-date, anti-breakage appliances, and over four million tons per annum are being handled.

Just as Barry and Port Talbot sprung into existence to compete with Cardiff, so Blyth deals with much of the coal that would otherwise have gone to the Tyne. The newer a port is the greater are its advantages for cheapness and efficiency, and it can readily profit by the experience of the older ports. It is not surprising, therefore, to find that Blyth, which has no considerable burden of river maintenance, but which is, so to speak, on the sea, is not only as efficient, but less costly than the Tyne ports, situated eight miles to the south. In point of tonnage exported it ranks sixth in the kingdom, and with the exception of timber and fish, this is almost exclusively coal.

A Large Coal Center

Blyth is situated in the center of the Northumberland coal district, eight miles north of the River Tyne, and has a population of about 30,000. It is primarily a coal-shipping port, staiths lining the river on either bank. It is also a colliery center and the town is not only surrounded by mines, but is built over the coal measures. Within four miles of Blyth there are 20 pits, with an annual output of about three million tons, while within a radius of seven miles there are 40 collieries.

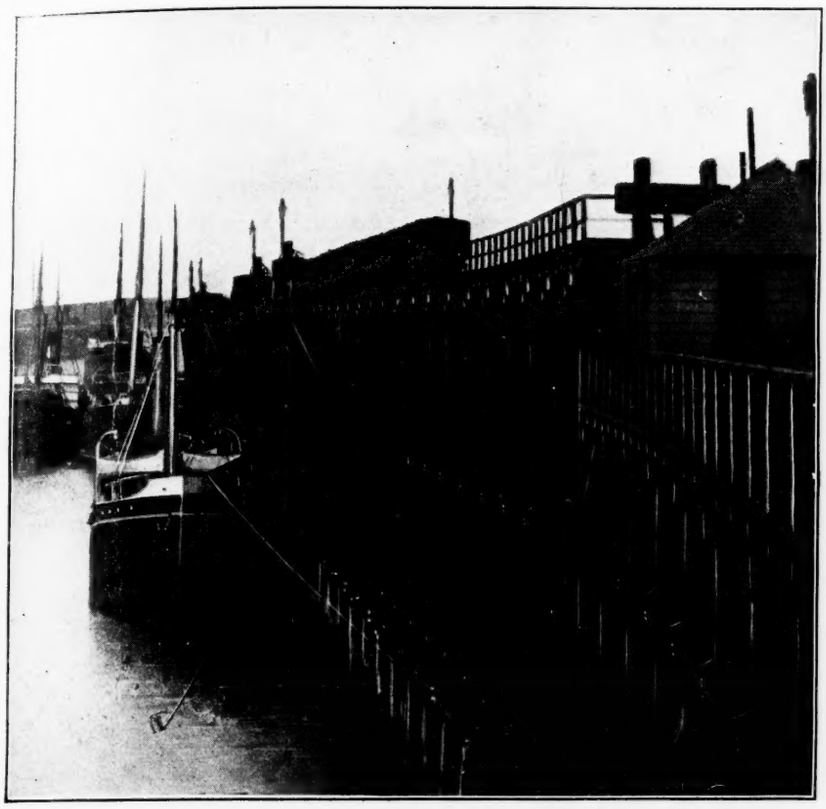
The town of Blyth is situated at the mouth of a river of the same name, the estuary of which forms the nucleus of what is now the harbor. Just before reaching the sea, the river turns to a southeasterly direction and the point of land and reef of rocks on the northeast side of the mouth has been utilized by the harbor authorities as a foundation for the outer pier. A deep-water channel has been dredged, having a depth of 38½ ft., and a width at the entrance of over 400 ft. A powerful flashing light at the end of the east or outer pier locates the entrance to the harbor over a radius of 15 miles.

All the staiths in the harbor are built on the high-level principle, the coal wagons being pushed to the highest end of the staith and then allowed to gravitate back over the hoppers, which feed the spouts, and, after being emptied, are allowed to run into the empty sidings. Coal can be loaded quickly, though the speed depends on the class of coal supplied and the construction of the vessel; in ordinary cases from 200 to 300 tons per hour can be dealt with, and with exceptionally easy loading vessels, as much as 700 tons has been put on board.

Loading Facilities

For preventing the breakage of coal, a Handcock anti-breakage appliance is in use at the various hoists. This consists of a series of trays or shelves on a revolving band, which lower the coal from the mouth of the spout into the bottom of the hold, where it is automatically discharged. One berth is also fitted with special elevators, which will put coal on board at a point 43 ft. above high-water level. Altogether 20 spouts are at work in the harbor and the total tonnage of coal dealt with per annum amounts to over four million tons.

At the west side of the entrance channel and before the main harbor is reached, a tidal dock of 23 acres has been provided surrounded with quays, on which are railway connections, cranes, etc. This part of the port is used for timber and fish and for the general import and export trade of the harbor. The facilities provided for the whitefish trade include an ice factory with a capacity for 20 tons per day, repair shops for the trawlers, coal hulks for bunkering purposes, in addition to the alternative means provided



A Near View of a Blyth Coaling Station

by hoppers in the quays, from which coal is transferred to the fishing boats by means of cranes; there is also a fish market with overhead stores and offices, from which fish can be loaded direct on cars for transit to any part of the country. In the summer there are large importations of herring, and the portion of the harbor set aside for the use of the curers presents a very busy appearance. A considerable import of timber takes place and general imports and exports, including machinery, cement, firebricks, fireclay, various kinds of iron and steel goods, salt, etc., pass through the port. For transportation, Blyth is served by the North Eastern Ry., the network of roads on both sides of the river being connected with their system.

A glance at the trade statistics of the port shows that rapid increases are being made. The shipments of coal in 1890 amounted to only 1¾ million tons, but in 1900 these had increased to 3¼ million, to over 4 million in 1908, and to nearly 4½ million in 1911. The arrivals of vessels, exclusive of fishing boats, in 1890 was 513, and in 1911 was considerably over 3000, with a total tonnage of 2,167,937 tons.

At the present time the commissioners have a bill in Parliament to extend the outer pier for a distance of about 1000 ft. into deep water, dredge an additional coaling place in the upper reaches of the river and erect coaling staiths with the most approved anti-breakage appliances, capable of dealing with an additional million tons of coal per annum; also the lengthening of the west pier and widening of the entrance channel.

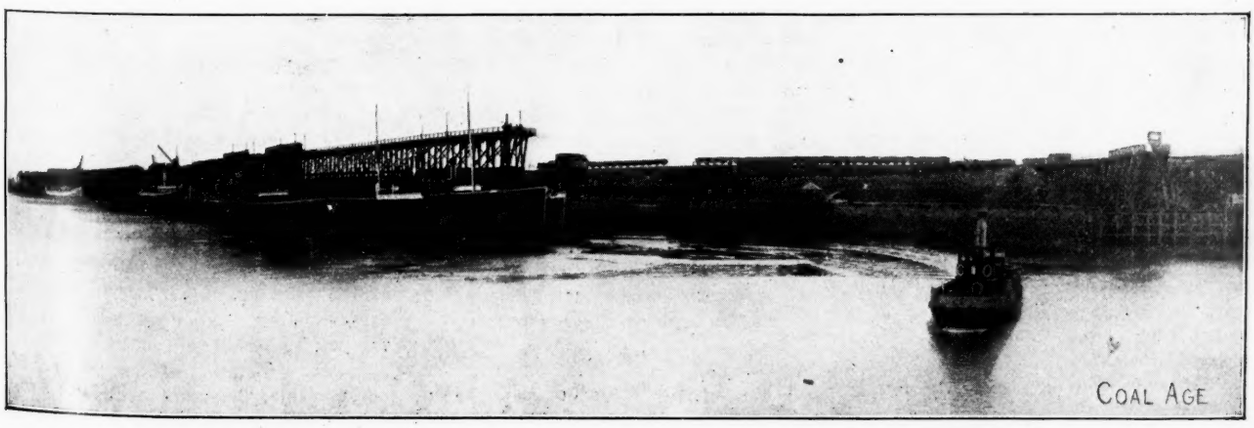
The depth of water in the entrance channel is 16 ft., at the loading berths 24 ft. and in the South Harbor from 18 to 20 ft., all at low water on spring tides. Steps are shortly to be taken to provide a coaling berth with 30 ft. at low water for dealing with the largest vessels frequenting the port.

History of the Harbor

A review of the history of the port shows that coal has been shipped from Blyth for upwards of 600 years. In 1854 a company was incorporated by an Act of Parliament to carry out improvements in the harbor and to borrow money for that purpose, but the venture was not, however, a success, the steps taken to improve the harbor proving insufficient to enable it to deal with the larger class of vessels coming into use after the utilization of steam power.

It was not until after 1882 when an Act of Parliament was passed, vesting the undertaking in a body of commissioners, that there were any signs of the development of the port to its present size. With the coöperation of the North Eastern Ry. Co. and the Cowpen Coal Co. new staiths were built, the commissioners undertaking the deepening and widening of the river and the erection of piers and quays. The result is shown in the increase of coal shipments from 150,248 tons in 1883 to 4,424,945 in 1911. The harbor authorities, under the chairmanship of Viscount Ridley, recognizing the advisability in the interests of the port of developing other trades than coal, are doing what is possible to develop the general imports and exports of the harbor. Some success has attended their efforts and hopes are entertained of a considerable development in this direction as time goes on.

The jurisdiction of the commissioners extends for three miles from the entrance of the harbor up the river and there is an unbroken line of river frontage on both sides.



A General View of Blyth Harbor, Showing Two Important Coaling Piers

Current Coal Literature

The Best Thought Culled from Contemporary Technical Journals, Domestic and Foreign

How the French Fight Mine Fires*

The following is an extract from an article by M. A. Aron, engineer of the Mining Corps of the French Government. His paper is entitled "The Fight Against Underground Fires," and is published in the Annales des Mines, Mémoire 10, Série 13. The words of M. Aron may be prefaced by the statement that the generality of American mine fires are apparently not like those in France.

For the most part, the fires in our mines are the result of the external application of heat by a shot or flame of some kind. The fire is not internal, and burns with very much greater rapidity. However, it is probable that there are coals or lignites in the United States which might be found to act in a similar manner to the French coal, and the use of the bemiring, mudding or silting device might, with modifications, be possible in American mines, especially in some cases.

Mudding a Mine Fire

"Mudding a mine fire is a most effectual operation, and we cannot too highly recommend its use. It consists of injecting into the heart of a body of solid coal a mixture of water and fine material. The water flows away, leaving in the fissures those matters which it carries in suspension. Thus slowly we seal almost completely all the cracks, and close all passages by which air may enter.

"The operation is equivalent to a hydraulic filling of a special kind, which fills, not the large open mine areas, but the fine cracks in the coal. It attains the same object as watering or spraying, without presenting the same inconveniences. It strengthens the pillars by rendering them more dense.

Flue Dust for Grouting the Coal

"The materials employed in this operation are fine clay, fine sand, or, better still, the impalpable dust of the flues of a steam boiler. This latter substance suits the needs of the case particularly well, and plants operating mines which are subject to fires should save it with care when the periodic cleansing of a boiler takes place. It is well to keep it always in stock.

"We can grout the coal by various methods. We can expel our mud on a level with the fire, or we can deliver it below or above it. The latter position is the most favorable, and it is often said that 'a fire which we can get above is a fire which is extinguished.'

"The action of gravity assists the circulation of the muddy fluid, and enables it to travel all over the zone which is heated, and renders a complete filling of the fissures almost certain. If, for example, the fire is found in the heart of the solid coal at *A*, we build a sloping traveling road *BC*, raising it as much as possible in the rock of the roof or in the solid coal. We then construct at this superior level a roadway *CD*, where we establish a working place for mudding.

Pumping Grout into the Hot Coal

"The two other methods (mudding from a level or from below) are also equally capable of giving good results. They are, in fact, as often employed. We can have recourse to them for instance, if the construction of the sloping traveling way *BC* appears to be difficult, either by reason of its length, or because of the breaking of the solid material of the roof.

"The necessary apparatus consists of a pump, (which is not needed when the work is conducted from above), a trough in which to mix the water and cinders, a pipe for injecting the mud, with a flexible hose which is adapted to carry the material from the pump.

"The pipe measures from 30 to 60 mm. in diameter.* It ought to be so long that it can be pushed into the solid coal 12 to 18 ft. For the purpose of inserting this pipe, a drill hole is made as far as is thought necessary.

"The water is brought to the trough in an almost continuous stream and the workmen throw into it, with a shovel, a suitable amount of material. A workman should be kept constantly stirring the mixture in order to prevent the accumulation of cinders in the bottom of the trough.

"Moreover he should be equally careful to remove all material which is too large for silting or which might obstruct the pipes. Further to assure the same end, we sometimes place a metallic screen at the suction end of the pump.

The Consistency of the Fluid

"The exact proportions of water and of solid material needed are difficult to determine with accuracy. It is necessary to avoid using a water which is too thin and which will wash out the fissures without mudding them.

"And here it may be said that we often take precaution at the beginning of the operation, to pump only pure water for some time. This washes out the fissures and cleans them of those particles of every sort which are likely to stop the passage of the muddy water. The mud should not be too thick for such a heavy fluid is likely to produce local obstructions.

"Pumps of various types may be used as for instance those with flat or with ball valves operated by one or two men, rotary pumps driven by hand or mechanically. The use of manual labor lends itself to an easy control of the proportions of the mixture. If the work of running the pump becomes too hard, we can increase the quantity of water. Should the pump work with great ease we can increase the proportion of cinders.

"We can manage to use in a shift of eight hours, depending on the character of the work and the dimensions of the pump, from three to ten cars containing 176 to 211 cu.ft. of cinders. About three men are needed to form one mud gang. Two are occupied with the pump and the third prepares the mixture.

The Water Flow Should Not Be Too Rapid

"The water ought to pass slowly into the solid coal, because if fed too rapidly it does not give the material the time necessary for its deposition. If the water which escapes is too muddy it is necessary to decrease the rapidity with which the mixture is pumped, or to thrust clay into the places where the water is escaping.

"The plainest proof of success in the operation is the return of the water quite hot and clear. This shows in effect that the water has attained the heated zone and has deposited the material which it held in suspension. This hot water falling into the working places often creates serious annoyance to the workmen occupied at other classes of work as for example the building and driving of roadways, the preparation of stoppings and the driving of airways near-by.

"If the generation of heat becomes too considerable, the man in charge should not hesitate to lay off the work referred to rather than stop the mudding, for the progress of the fire extinction is attested

*Translated from the French for Coal Age by R. Dawson Hall.

*Equivalent to pipe between 1¼ and 2½ in.

very plainly by the disengagement of heat.

The return of clear water, but cold, leads us to presume that it is being delivered at a point too distant from the heat center. Under these circumstances, we should remove the mudding pipe or replace it by one of greater length. If we wish to attack the fire without the use of pump pressure, it can be done by building a scaffold in front of the coal and mixing the materials thereon.

Evolution of Much Heat a Good Sign

At the commencement of the mudding action, the passing of a large quantity of water into the solid coal often gives place to a disengagement of heat. It is well to foresee this circumstance that it may not be interpreted as an undesirable indication.

Mudding ought to produce an improvement in this condition, but the fire chased from one point may appear in another. It is then advisable to proceed either simultaneously or alternatively to several predetermined mudding stations.

The results of mudding are only sensible after one or several days have passed; but it is rarely the case that after the end of this period, one does not discover a real improvement. The smoke becomes less abundant; the water, which at first was scalding, appears lukewarm or even cold. As soon as this occurs we can hope to recommence the withdrawal of the heated coal which has been temporarily interrupted.

How the Burning Coal Is Removed

We can then determine exactly what work has been done by the mudding in the period of direct attack. We commence a heading to withdraw the hot coal. If at any moment the work becomes too trying it can be suspended. The fire appears at the same time in certain points of the roof.

We water the incandescent parts but the heat remains quite high and it is feared that the progress of the fire may be more rapid than that of the excavation. We then stop the work of advance and establish the working place from which to continue our mudding process. After two or three days, by dint of impregnation of the coal with mud, the pillar becomes cooled and we can advance the heading 9 to 12 ft. At this point we are again stopped by the difficulty of conducting the work. A new period of mudding follows, and this is succeeded by a further advance of several feet and so on, until the extraction of all the heated panel is completed.

[Since the publication of this article in the *Annales des Mines* important developments have taken place in the mudding of fires; the modern practice will be described in an early issue.—Editor.]

Possible and Problematical Savings

In the preface to bulletin 47 of the Federal Bureau of Mines, entitled "Notes on Mineral Waste," written by Charles L. Parsons, chief mineral chemist, Dr. Joseph A. Holmes, the director, gives his views upon what he terms real conservation. Dr. Holmes says:

"During the past year, in producing 500,000,000 tons of coal we wasted or left underground, in such condition that it probably will not be recovered in the future, 250,000,000 tons of fuel. We turned loose into the atmosphere a quantity of natural gas larger than the total output of artificial gas during the same period in all the towns and cities of the United States. We also wasted or lost in the mining, preparation, and treatment of other important metalliferous and nonmetalliferous minerals from 10 to 15 per cent. of the year's production of such minerals.

Waste not a Folly But a Fault

"In a consideration of the possible activities of the individual, the state, and the Federal Government in behalf of a less wasteful use of our mineral resources certain facts and principles should be kept clearly in mind, namely:

"That the present generation has the power, and it will exercise the right, to use as much of the country's resources as it actually needs; there can and there will be no such thing as stinting the present generation by bottling up resources for the use of the future.

"That the nation's needs are not likely to be curtailed; these needs will increase with the extent and diversity of the nation's industries, and they will increase more rapidly than population increases, for the statictics show that the per capita consumption of mineral products is rapidly augmenting; and

"That the men of this generation will not mine, extract, or use these resources at continuous financial loss to themselves in order that something may be left for the use of future generations. There can be no such thing as a mineral industry without profits.

The Fuel Resources Belong to the Nation

"Furthermore, it should be clearly understood that the mineral resources of this country have required long ages for their accumulation and that of these resources the nation has but the one supply. There are no known substitutes available to meet the nation's further needs when that supply will be exhausted and, to the best of our present knowledge, this one supply must serve as a basis for both the needs of the present and the far greater needs of the future.

"In a higher way our mineral resources should be regarded as property to be used and to be held in trust with regard to both the present and the future needs of the country. It should be remembered that neither human labor nor any human agency has contributed to their origin or to their intrinsic value, and that whatever rights the individual may possess have been derived from the general government and from the state as the original owner.

"The state cannot surrender its duty to safeguard the welfare of its future citizens by preventing the wasteful use of these resources. Though the individual may claim the right to use the resources in proportion to his needs and the needs of the community, he certainly has no right to waste that which is not needed for present use but is certain to be needed hereafter.

"Those in charge of the investigations of the Bureau of Mines recognize the rights and duties of the Federal Government as being limited to the carrying on of inquiries and investigations with a view to determining the nature and extent of this waste of resources, the means by which it may be diminished, and the setting forth of the facts in the case."

[The estimate made in this statement of Director Holmes, relative to the loss of coal in American mining does not accord with the facts as viewed by men who are able to judge the situation with accuracy. There is no reason to believe that one-third of the coal resources of the country are now being wasted.—Editor.]

Illuminating the Cross Hairs in Mine Surveying

By George M. Brown*

In discussing practical problems in mine surveying with several engineers in this district, I find that many of them are still using sheets of white paper torn from note books, etc., to reflect the light upon the plumb bob in taking "sights" below ground. This method requires the illumination of the cross hairs in the instrument.

I find that a small piece of tracing cloth about 6x9 in., held two inches behind the plumb bob or string and illuminated from behind, will show good results in sighting up to 300 ft., (depending on power of telescope) and no illumination of cross hairs is necessary. They will stand out clear upon the illuminated tracing cloth. The cloth will easily last one or two days.

All men applying for training in mine-rescue work should undergo a stiff physical examination and unless their physical condition is good, the action of lungs and heart strong and the nose and throat in good order, they should not be permitted to take up the work.

*Engineer, The Great Western Coal & Coke Co., McAlester, Okla.

Who's Who—in Coal Mining

Devoted to Brief Sketches of Prominent Men, Their Work and Ideas

A great many years ago, Horace Greeley said, "Go West, young man, go West," and this clarion advice of the great journalist who founded the *New York Tribune,* has been repeated time after time with results wholly satisfactory to the broad land referred to. Generally, the men who have shaken the eastern dust from their feet and have cast their fortunes in with the sturdy toilers who are building our great western empire, have been influenced in their course of action by the broader opportunities afforded, and greater freedom of the newer land.

Occasionally the goal sought is health rather than riches, and our western plateaus can show many examples of "humans" made strong from contact with the clear air and the never-ending sunshine. Frequently when hope has all but disappeared, and the doctor's ultimatum has been sounded into the ear of the patient, the journey from the sea to the mountains has been taken as a forlorn move. Many a life ended of all usefulness in the East has been reclaimed and commenced all over again in that land bordering on the Rockies. And let it be said further that the bargain struck has not always been to the sole advantage of the individual; the West itself has often gained a great mind and a fine character for its gift of a pair of strong arms.

And, sometimes, when a fellow has a little more than his full share of vigor and strength, fate squares the account by having him bear part of the burden of some dear one who is less richly endowed with physical blessings; and in cases of this kind a real man forgets self and often sacrifices a promising career to improve the chances and make the going a bit easier for another. In this way the West is again winner in the hand dealt out by fate, for when it secures that kind of an individual who can submerge self and make personal ambition secondary to the desire for another's welfare, then a life worthy of respect and a will that must count, has been enlisted in the cause of western progress.

E. H. Weitzel, manager of coal mines for the Colorado Fuel & Iron Co., is a man of the sort that typifies the West. He was born at Mt. Pleasant, Penn., Sept. 6, 1868. His father first saw the light of day in Somerset County, Penn., coming of stock that emigrated from Germany about 1835.

E. H. WEITZEL

The parents of "E. H." moved to Wilkinsburg (suburb of Pittsburgh) in 1874. It was here that he attended public school, thus securing his early education. He later was enrolled at Newells Institute, a preparatory school in Pittsburgh, taking a course in mathematics.

He began work in 1877 as chainman for Hugh Neal, a Pittsburgh engineer. In 1888 he entered the service of Edeburn & Cooper, civil and mining engineers, 410 Grant St., Pittsburgh. In this latter position he was given a considerable amount of mine surveying to do, and in connection with his work for the New York & Cleveland Gas Coal Co., became acquainted with T. B. DeArmit, general superintendent of that concern.

In 1895 he left Edeburn & Cooper to accept a position as engineer for the New York & Cleveland Gas-Coal Co. While occupying this place, Mr. Weitzel had good opportunities to learn the practical end of the mining business. The mine foreman's position at the Turtle Creek mine of the New York & Cleveland Co., was at that time occupied by W. P. Owens, and Mr. Weitzel is firm in his belief that the training he secured from his association with Mr. Owens (who died recently at the age of 86) was a valuable part of his early experience and had much to do with whatever success he has attained in his later work.

In July, 1901, "E. H." left the employ of the Pennsylvania company he had served for six years, and accepted the position as chief engineer for the Empire Coal Mining Co., a corporation operating several mines in the vicinity of Bellaire, Ohio. In September, 1902, he was promoted to the position of general superintendent of the Empire company.

About this time Mrs. Weitzel, who had developed tubercular trouble some years before, became very ill, and Mr. Weitzel decided to follow the doctor's instructions and see if the health of his wife would not be considerably improved by living in a higher and drier climate. He accordingly secured a two-months' leave of absence and went with her to Silver City, New Mexico, where she rapidly recovered. Feeling, therefore, that the western country was essential to the good health of his family, in August, 1903, he resigned his position with the company in Ohio, and returned to New Mexico to make it his permanent home.

Having no acquaintances whatever in the West, he decided to visit some of the mining camps and seek employment. The first property visited was at Dawson, New Mexico, operated by the Dawson Fuel Co. (now known as the Stag Cañon Fuel Co.), and being impressed with the healthful surroundings he secured work in the mines loading coal. After working as a miner for two weeks, he was given a position in the office as mine clerk and served in this same capacity until December of that year, when he was appointed chief engineer of the Dawson company. The following September he was promoted to be general superintendent.

In April, 1906, Mr. Weitzel moved to Trinidad, Colorado, in order to secure better school advantages for his children. He opened a general engineering office at the same time, retaining a connection with the Dawson Fuel Co., in a consulting capacity. In 1907 he was elected city engineer of Trinidad, and in addition to his municipal work, occupied the position of chief engineer to several small coal companies in southern Colorado. In August, 1907, he accepted the position of chief engineer for the fuel department of the Colorado Fuel & Iron Co. In 1908 he was appointed manager of coal mines for the C. F. & I. Co., which position he occupies at the present time. The recent betterment in net earnings and general improvement in the financial condition of Colorado's biggest industrial concern is due largely to the earnest and efficient work of E. H. Weitzel.

Issued Weekly by the
Hill Publishing Company
JOHN A. HILL, Pres. ROB'T MCKEAN, Sec'y.
505 Pearl Street, New York.

Monadnock Bldg., Chicago.
6 Bouverie Street, London, E. C.
Unter den Linden 71—Berlin, N. W. 7.

FLOYD W. PARSONS, Editor.

Correspondence suitable for the columns of COAL AGE solicited and paid for. Name and address of correspondents must be given—not necessarily for publication.

Subscription price $3 per year in advance for 52 numbers to any post office in the United States or possessions, and Mexico. $4 to Canada. $5 to any other foreign country.

Subscribers in Great Britain, Europe and the British Colonies in the Eastern Hemisphere may send their subscriptions to the London office. Price 21 shillings.

Notice to discontinue should be written to the New York office in every instance.

Advertising copy should reach New York office by Thursday of week prior to date of issue.

Entered as second-class matter, October 14, 1911, at the post office at New York, New York, under the act of March 3, 1879.

Cable Address, "Coage," N. Y.

CIRCULATION STATEMENT

Of this issue of Coal Age, we will print 8500 copies. No copies will be sent free regularly. There will be no back numbers. The figures shown here each week represent live, net circulation.

This journal is interested solely in matters relating to the fuel industries, and is designed to be a medium for the free interchange of ideas, the detailed description of coal-mining practice, and the expression of independent thought calculated to benefit both operator and miner.

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COAL AGE

The Anthracite Shortage

Despite the numerous aggravating interferences with production in the anthracite region during August, the shipments for the month showed a general and consistent smashing of records all along the line and the establishing of a new high level for the district. Shipments for the month exceeded those for August of last year by over a million tons, and reduced the total shortage for the first eight months of this year, as compared with that for the same period last year, to about six and one-half million tons. Should the companies continue to exceed previous records in the same ratio, it would take about six months to wipe out the total shortage.

Whether they will be able to do this is a question; during August of last year the mines worked quite slack, so production was naturally below normal; but, on the other hand, the same was the case, to a certain extent, this year. It is undoubtedly true that the operating departments are being pushed to the limit and plants worked to the utmost capacity; there are also rumors that some of the independents are making arrangements to double shift their mines, but it is doubtful, in view of the labor shortage, if this can be accomplished.

Much alarm prevails over the hard-coal situation in all parts of the country, and it is probable that there will be a spectacular market during the coming season. There are already rumors of large premiums being offered for the entire production of some of the independent operators, and it is stated that a number of these are exerting strenuous efforts to increase their output. On the other hand, the labor shortage is so pronounced, that it is highly improbable that their efforts in this direction will be productive of any results.

It seems reasonable to believe therefore, that under the best conditions, the shortage, due to the April suspension cannot possibly be overcome in less than six months, or before the first of March. As the demand will have slacked off appreciably by that time, it will be too late to expect any relief in that direction.

The Value of a Life

The conservationists in their perfervid zeal have made a number of estimates on the loss of money resulting from an inadequate care for human life. Their calculations usually are wide of the mark, as viewed from any reasonable standpoint, and trivial indeed it seems to balance life against savings.

Yet a certain regard for material wealth must ever be displayed, sordid though such a view may seem. If we evaluate blood as too precious to shed for any human advantage, then all trades, especially all those reputed dangerous, would close down one by one. But the needs of one life are balanced insensibly against the hazards of another.

We must be warmed, so men mine coal; we need farm produce, and the farmer is stricken under a broiling sun; we need stoves, and the foundry hand pours a flask of metal, which may explode at any time. The materials of industry are necessary to our daily needs, and men must build and operate railroads to bring those products to our doors. A sensitive man cannot but see the stain of blood and etching tears of sorrow on everything he uses.

The needs of life demand its risk; we cannot entirely avoid the hazard. Did we part with coal as fuel, men would cut their limbs with axes and be caught in the premature falling of the trees they strove to cut down. Wherever the miner looks around his cabin, he sees objects produced, if not at loss of life, at least in face of its hazard.

The death of a man is not accompanied with much depletion of wealth. The day's output and the day's consumption balance for nearly all men or all families. The better paid workingmen only consume the more; few there are who leave a balance for posterity.

So that the call to save life is not

conservational, but rather ethical. It is largely the recognition of private rights. A man has a right to live, which no one should abridge. He has a right that men should in some measure protect him from dangers which threaten him, and that right is not derived from or even measurably increased by the monetary consideration.

But when a man deliberately enters the business of protecting the public from itself, he is not merely destroying the little economic balance he has hitherto struck for the public good, but is arranging that henceforth he himself will produce nothing and will be a charge on the public. No matter how exalted his office, or how devoted his labors, thereafter, if he fills his chosen vocation and performs no other service, he is dependent on the real worker for his whole sustenance.

The charge on the world for the protection of the mine worker is not excessive. That it is as large as it is, probably few of us realize. We do not have at hand a complete roster of all mines, or of the number of foremen, assistant foremen, fire and rib bosses and timbermen they employ, nor can we with precision estimate the average salaries of such men or tell how much of the work those officials perform is really productive. In fact, between controlling men in the interest of safety and marshalling them as productive units, there is little opportunity left for any of the types of officers mentioned to do much actual productive work.

Perhaps the gross annual cost on the public of the United States for safeguarding the coal industry and for economic supervision by such mine officials as are subordinate to superintendents is not less than $16,000,000. Dividing that sum in half will place the cost of protective supervision at $8,000,000. This sum would give the dependent of every miner killed last year about $3000.

This overlooks the injured and does not consider the still larger number who might have been killed if an $8,000,000 fund had not been raised to protect them by more or less adequate supervision.

We cannot tell how many might have died or suffered, had not that fund been raised, but it is likely that fewer men are saved by our care than yearly succumb to the dangers of the mine. The estimate is only given to show that the figures of the conservationists are in error, that conservation as conducted is highly expensive, and that every effort should be made by the individual to make such wasteful "husbandry of resources" unnecessary.

The cost of this unproductive toil must be paid by the masses. The money expended on it, will come, not so much from the hoards of the wealthy as from the paltry pennies of the poor. For the poor people are the big consumers and all the increased costs of production must add to their cost of living.

Let it be remembered by those who seek new methods of policing year by year that such supervision has raised the cost of living abroad and will inevitably raise it here. The need today is for each man to take the problem of safety as his own immediate hobby that the life savers may be laborers and as omnipresent as the life-hazarders.

Salaries in the Bureau of Mines

The Bureau of Mines, unlike our universities and colleges, was not created for the purpose of teaching callow youths; it was instituted rather for original research, and to develop new lines of thought in men who have made the sciences and their application a lifework of study. The men needed to carry on its work are scarce and not only the Bureau is seeking them. In view of the meager salaries provided by Congress, criticism of the engineers now engaged, is unkind and unjust. Who can say that they are not giving us many times as large a return for our appropriation as we have any right to expect?

If we need a postmaster in a country town to handle a few thousand letters a month, we leave it to the President to select such a man. It is an executive position, demands original brain power of its occupant and the individual cannot be chosen by an impersonal examination.

But a "job," the word is used advisedly, a job on the Bureau of Mines is a different sort of position and the one who would fill it, can be satisfactorily examined for admission. These young men, who are to lead the world to new thoughts and new practices are required first to tell all about their past history, to submit to the commission recommendations for former employers and to demean themselves generally as if suitors for a job.

We confess the methods of our English cousins please us better. They seek the person who they know is fitted because he has previously shown conspicuous ability, and when he accepts, he is given commensurate compensation.

He does not debate whether he could make more money rounding loafers at a city corner or as a village contractor shingling barns and adding the popular colonial porches to wind-shaken houses. He is already a man of mark and if he does not do good work everyone is and has a right to be amazed.

We have wondered at the call for a sociologist in the Bureau, now running as a "Want Ad" in the papers of the country. We cannot tell what kind of work he may be called upon to perform. Someone has suggested that he should be a mine manager. We can hardly conceive that a man with such training and experience would be best equipped to do the work even if he could be obtained for the paltry salary offered.

We think rather he should be a doctor if he is to recommend better living conditions, or perhaps a recognized leader in social movements if he is to devote himself to welfare work, or a municipal engineer, if he is to prepare plans for sewerage. The advertisement is so vague it does not afford any indication.

We hardly think it will be found necessary to keep such a man continuously on the force. The head of an important bureau needs competent advice. He cannot be informed safely by incompetent men, and it would seem better to engage an eminently scientific man for a short time rather than blunder along for several decades at a considerably greater expense with a well meaning but ill-equipped tyro.

We have copyists galore. Many are those who can follow the lead of another, but the Bureau must be in advance of the industry or it must become merely a board of publication, a translator of foreign *mémoires* or a demonstrator of others experiments.

Is this old world to be revamped by $2000 men? We think not and if perchance one man should prove an exception, the evidence is clear that a good man has been wrongly deprived of the meed which was rightly due him.

Sociological Department

For the Betterment of Living Conditions in Mining Communities

The Emergency Hospital

From a series of articles on rescue equipment, by Gustav Ryba, published in the *Zeitschrift des Zentral-Verbandes der Bergbau-Betriebsleiter,* we translate the following extract:

The emergency hospital where preliminary treatment is given to the injured should be preferably coated on walls and ceiling with white enamel or enamel paint. The walls are often lined with white tiles for 6 or 7 ft. from the floor and then all above this tiling is covered with enamel.

Prime Requisites—Cleanliness and Ventilation

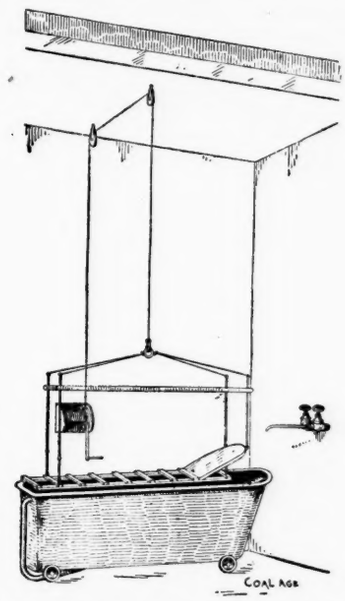
The fittings of the room should also be enamelled white, because they will then show dust plainly and can, therefore, be kept thoroughly clean, which cleanliness, of course, is absolutely essential. Importance must be attached to good ventilation, which may be provided by means of inlet dampers at the floor and outlets at the ceiling.

In cold weather it is best to heat by steam, the radiators being set preferably in the window alcoves, where the cold air ducts are situated, so that the exterior air is warmed by passing over hot surfaces as it enters. Care must be taken to provide sufficient light. The windows should be frosted or corrugated to a height of 6 or 7 ft. above the floor. Window shades should be provided for night use.

In this room the stretchers should be kept, the oxygen rescue apparatus, instruments, drugs, bandages, etc. A wash basin is provided for the surgeon and his assistants. Sand, soap and hand brushes are placed beside it. It is also well to install also a bath tub for thoroughly cleaning the patient before beginning the surgical treatment. When the regular hospital is far from the mine, the final treatment is often given here.

To avoid hurting the patient, it is advantageous to have a portable shower bath and a water supply, the temperature of which can be regulated at will. For removing the patient from the stretcher to the tub with minimum pain there are various sorts of conveyors of the nature of cranes. One type is like a traveling crane which runs the length of the room, and there is a supplementary traveler which moves transversely. From the crane swings a carrier with head rest, and on this the patient is conveyed and lowered into the bath tub.

Another arrangement is shown in the figure. Here the carrier is swung from the wall; after the patient has been transferred to it from the stretcher. It is then hoisted by means of a windlass and the bath tub is rolled under it. For local surgical treatment of mine injuries an operating table is provided with mattresses, pillow and waterproof rubber cover.



Windlass, Pulleys and Carrier for Transferring Patient to Rolling Bathtub

Note—Translated from the German, for Coal Age, by E. P. Buffet.

Prizes for First Aid Work on Real Victims

Announcement has just been made by the national headquarters of the American Red Cross at Washington of the names of those who are entitled to prizes for exceptionally skillful first-aid work rendered during the past year.

About a year ago a gentleman, who does not desire his name to be made public, presented to the Red Cross a special endowment of $5000 to be known as the William Howard Taft Fund, the income from which is to be devoted annually to prizes for first-aid work and competitions among the railroad men of the country.

The Red Cross Prizes

The Red Cross from its own funds also gives similar prizes to first-aid men other than those employed by railroads. The winner of the first prize of $50 in this class is John Brown, mine foreman, Pennsylvania Coal Co., Pittston, Penn., who rendered excellent service to three men who were burned and otherwise badly injured by an explosion of gas in the Hoyt Shaft on Jan. 10, 1911.

In an affidavit made by the resident physician at Pittston hospital, relative to the manner in which the injuries of these men were treated, it is stated: "It would hardly have been possible for any physician under the most favorable conditions to have accomplished better work, and I take pleasure in testifying to the value and efficiency of the work in these three particular cases."

Case of Fracture

James Gibson, an employee of the Berwind-White Coal Co., of Windber, Penn., was the successful contestant for the second prize of $25, having rendered first-aid treatment in a skillful manner to Frank Koniski, who, on Oct. 5, 1911, while loading coal, was injured by rock from the roof of the mine falling on him.

He sustained a compound fracture of the left leg, comminuted fracture of the right leg involving the knee, fracture of the right shoulder blade and a bad sprain of the back. The success of this first-aid treatment was assured by the prompt action of the man rendering it.

The fall occurred at 1 o'clock, it took 15 or 20 min. to dig the injured man from the débris and only 15 min. to render first aid and put the injured man in proper shape to be carried out of the mine where an ambulance, which had been called by telephone, was waiting to carry him to a hospital.

An Injury Received Above Ground

The third prize of $15 and fourth prize of $10 were divided equally between Thomas M. Robertson and Fred Causer, who were also employed by the Berwind-White Coal Co. These men rendered first-aid treatment to Alonzo Yonker, who, on May 7, 1911, fell from a stack to a concrete floor, a distance of over 25 ft.

The injuries in this case consisted of a compound fracture of the lower jaw, front teeth knocked out, broken knee-cap and general contusions. A physician arriving 15 min. after the accident, after examining the injured man, stated that the work of the Red Cross men could not have been improved.

Discussion by Readers

Comment, Criticism and Debate upon Previous Articles, and Letters from Practical Men

The Fireboss, A Suggestion

I noticed, in the issue of COAL AGE, Aug. 10, p. 205, an account of a fireboss having his certificate revoked, for a violation of the mine laws of West Virginia.

I am not going to question the decision of the Department of Mines of that state; but, at the same time, I have a good deal of sympathy for firebosses in general, because I have been a fireboss myself. Not long ago, there was a discussion, in COAL AGE, on the fireboss question; and I noticed that one superintendent was in sympathy with the fireboss, having been one himself and knowing their difficulties (COAL AGE, Mar. 30, p. 819).

In my opinion, the fireboss is the hardest worked man in the mine, to say nothing of his responsibilities. All mining men know the prescribed duties of the fireboss; but only the man who has firebossed, in a district where the lives of over a hundred men are in his charge, knows what is expected of that official. A very slight mistake may cost several lives and make scores of widows and hundreds of orphans.

It is quite evident to me that this fireboss was a competent man. He had found the gas, but neglected to put up a danger signal; and this mistake cost him his certificate, besides causing those who were burned much pain and suffering. It might, however, have been worse.

Does any one, for a moment, suppose that it is possible for a fireboss to satisfy himself or properly carry out the requirements of the mine law when he is required, in a short two or three hours, to visit and examine over a hundred working places and keep them safe?

On descending the shaft he must first see that the ventilating current is taking its usual course, after which he must proceed to examine each place in his district. Another thing he must do that is not in the mine law (and no one knows this better than the fireboss); he must be back at the shaft to give out the lamps so that the men can get to work promptly at starting time or he will hear from those higher up. It is safe to say that a man who can make some fireboss' rounds on time, to say nothing of examining the places, is in fair training for a Marathon runner. He might be able to get his mark on the places, by running through the crosscuts; but, in many cases, that is all he can do. Then, he must make his second round; and, then, there is the gobs to examine and the air courses to travel; and, perhaps, he must come back at night, once or twice a week. Also, he has to take his turn at Sunday work. It is no wonder that good men are hard to get and difficult to hold.

Not long ago, there was a law passed to prevent engineers and conductors from working more than 8 hours, without taking rest. Would it not be well to pass a law limiting the number of places the fireboss must examine and the time he can work, to so many hours in every twenty-four? I feel that the miner should have just as much protection as the traveling public.

THOMAS HOGARTH.

Scalp Level, Penn.

Waste in Mining Coal

I am frequently annoyed by the foolish wastefulness of coal miners, having mined coal myself and having filled various occupations in coal mines for over 30 years. When mining coal, either at the face or on rib or stump work, I have always considered the value of timber. Nothing, not even a cap-piece, was allowed to be lost, in making a fall, if it was possible to save it without risk. After the fall, the time saved in posting for the next lift well repaid the time spent in recovering caps, posts, etc., The miner, today, seems to have so little regard for economy in mining, that I have, on more than one occasion, suspended men for such careless or criminal waste. Many a time I have gone into a place that had been abandoned the night before, and carried out posts, caps and rails that would have been buried in a short time when the place caved.

Such waste on the part of the miner is both criminal and foolish. Not only is he robbing his employers, but he is wasting material that he will lose time looking for, later. I do not mean by this that I want any man to risk his life to save a post or cap. I only claim that all loose timber should be carried to a place of safety before drawing posts for the purpose of inducing a fall; and all roads should be taken up and brought back, even though some of it may have to be relaid after the fall. It is both amusing and annoying to see men who have made a fall on a rib, start in on the rib again and get a loaded car off the track. Then, with a curious mixture of cuss words, they go hunting for pieces of rails and caps to block up the car, declaring they never saw such a place where they could get nothing. Yet within a few feet of them lies buried all the material they require.

FIREBOSS.

Braznell, Penn.

Humidity of Mine Air

I have been much interested in reading the several articles on Humidity of Mine Air.* We should try to keep the mine air up to its maximum humidity, as nearly as is practicable, at all times, whether it be winter or summer. If the temperature of the air entering the mine is raised by artificial heat and moisture injected into it to bring it up to its maximum humidity, during the cold months of the year, it should not be expected that the air so treated will maintain the same state of maximum humidity throughout the mine, without taking up moisture in other parts of the mine; because it deposits moisture in places where the air is cooler, and this occurs at frequent intervals. There are also other causes which have the same effect, such as the natural heat of the strata and mine fires, etc, etc. The humidity of the air is undergoing constant changes, as it passes through the mine, taking up moisture in places, and, again, depositing moisture. The greatest changes occur where the temperature of the air varies most.

During certain periods of the year, when the outside air is of the same temperature as the interior of the mine, the amount of moisture taken up, or deposited in the mine, will depend largely on the degree of saturation of the outer air. When, however, the temperature of the outside air is higher than that in the mine, an excess of moisture may be carried into the mine, and deposited there. Again, when the temperature of the outside air is lower than that of the mine, moisture is absorbed by the air current and taken from the mine. It is this latter condition that renders mines more dangerous during the winter months.

The temperature of the interior of large and extensive mines is nearly constant during the entire year, while the temperature of the outside atmosphere may change considerably. The greatest difference of temperature between the exterior and interior occurs during the coldest periods of the year.

*Coal Age, Vol. 1, p. 1178; Vol. 2, pp. 17, 93, 129 and 197.

Cold air when fully saturated may not, and generally *does* not, contain as much moisture as warm air partially saturated. The power of air to absorb moisture increases as the temperature increases, and for this reason it is necessary to inject additional moisture into the air as it passes into the mine during the cold season of the year, in order to prevent, as far as possible, the absorption of moisture from the mine.

When the air enters the mine at a temperature lower than that of the mine, its temperature is gradually raised by the natural heat of the strata, and it absorbs more moisture. On the other hand, if the air entering the mine is warmer than the air of the mine, it is cooled in its passage through the mine and is compelled to give up some of its moisture, which is deposited.

Steam is always objectionable on intake haulage roads; but in conclusion, I would indorse the suggestion, that where a blowing fan is used and the haulage is done on the return air, the exhaust steam from the pumps or fan engine may be led into the intake with good results. If this is not practicable, some other means should be provided to humidify the air. A water pipe with suitable connections for spraying the air should be laid along all headings; or suitable trucks with hose attached, should be kept for the purpose of spraying the road and the working faces of all rooms, and other accessable parts of the mines to keep these in a damp condition.

BENJAMIN HARTILL.

Johnstown, Penn.

Mine Fires

Regarding the safety of the workers in mines, of the first importance, I wish to offer one or two suggestions in reference to the prevention of mine fires and the rescue of miners in case of an outbreak of fire becoming dangerous.

Whatever system is employed, all small coal should be sent out of the mine and not thrown into the waste. If the seam has a decided dip in any one direction, and water is available, work the coal out from the dip boundary toward the rise, allowing the gob to fill with water as the coal is excavated. A good current of air is essential in the prevention of fires, as it keeps the mine cool and reduces oxidation. Good ventilation is important and always welcome to the miners, who should always have good air in their working place.

Build all underground engine houses, pump rooms, tool shanties and other like structures of fireproof material, and allow no oily waste or other inflammable material to be stored or to accumulate in the mine.

By providing the necessary valves and suitable hose connection on the rising main or column pipe, the mine pumps may be brought into use to extinguish fires; a fire or hose truck, and hose should be kept in readiness, to be taken inby to the nearest pump when required. Where the mine is dry a water car with hand-pump and hose attached might be of great service in the early stages of a fire. Water mains are often laid along the roads, and at times these are connected, by boreholes, with pumps on the surface. Water must be used with discretion, or the evil will be aggravated rather than repressed, where gob fires are concerned.

Should all attempts to subdue the fire fail, recourse must be had to flooding the mine, this being a last resort, however. In mine fires large numbers of men have lost their lives from ignorance of what to do in face of such a danger.

I strongly urge that all miners and mine officials from each district of the mine, should be made fully acquainted with the mine and its escapeways, and should travel the same at stated intervals to keep them in mind. All side openings should be fenced, and the direction to the upcast and other escape openings indicated by white arrows or other means, and be maintained in good traveling condition. The upcast should be fitted with suitable ladderways or hoisting machinery and kept in readiness for hoisting men on short notice.

Airways arranged for reversing the current, are recommended. Obviously, if a fire breaks out in the intake, the return airway is the proper way of retreat. It may be well, in some cases, to give a false alarm so as to drill the men to act with calmness and presence of mind when the need arises. It is impossible to lay down hard and fast rules to cover all contingencies, but many lives might be saved if discipline and order prevailed, and miners knew how best to act when the emergency arises.

JOHN E. SPICER,
Pacific Coast Coal Mines.
South Wellington,
Vancouver Island, B. C.

Economy in Coal Mining

Coal mining is one of the most important industries in this country, producing, as it does, 500,000,000 tons of coal annually, and giving employment to over 750,000 mine workers, to say nothing of the thousands of managers, superintendents, foremen and other mine officials. Millions of dollars are invested in this industry. By the present systems of mining, many tons of coal are left in the ground, and abandoned beyond any hope of recovery.

In the commercial world, the law of competition is the dominating influence. The survival of the fittest is the recognized basis of individual action. The sharp competition in the marketing of coal reduces the selling price, and some writers attribute the tremendous loss of life in coal mining directly to this cause, claiming that the demand for cheap coal is largely responsible for the dangerous conditions that often prevail in the mine, and that the waste and abandonment of good coal results from the same cause. I cannot believe this is the case. With the class of labor now employed in and around the coal mines, accidents will happen, regardless of the price of coal.

In reference to the waste of coal, I think this depends more on the management than on the market value of the fuel. When these conditions are taken into consideration, it would seem that the coal operator has no one to blame but himself, for the present condition of the industry. Competition that will reduce the price of labor below a living wage and lead to the abandonment of good coal, for coal that can be mined more cheaply, is ruinous to any industry.

What is needed is a greater stability in the coal-mining industry, and this can only be gained by operators coming together and demanding legislation that will afford relief. It is easy to see this is no small problem, when the difference in the conditions in respect to mining, labor and markets in the different states are considered. Changes in mining law must be made with caution. The operation of the new bituminous law in Pennsylvania (1911) has compelled many coal operators to make changes in their plans of operation, by which it is claimed, in some cases, the cost of production has been increased 4c. per ton. It is believed, however, that the results obtained under the new law warrant the changes that have been made. The most successful mine law must consider not only the rights of employer and employee, but likewise, those of the people whom they serve.

The superintendent who pays one or two flying visits to the mine in a month, and finds, then, only time to walk around the outside, is in no position to decide many matters that come before him, and which vitally affect the cost of production. He is the man that is responsible for the high cost of production; because, from his limited knowledge of conditions, he adopts a "penny-wise and pound-foolish" policy. A wise superintendent will know his men and confer often with the pit committee, which is generally composed of the best men employed in the mine. Such frequent conferences go far to strengthen and establish amicable relations between the company and the men in their employ, and eventually reduce the expense of operation. Where such a policy has been adopted and carried out by the superintendent and those acting under his orders, we hear less of the cry, "Economize! Economize!"

HENRY MCCLUSKEY,
Mine Foreman, Pittsburgh Coal Co.
Gradatim, Penn.

Inquiries of General Interest

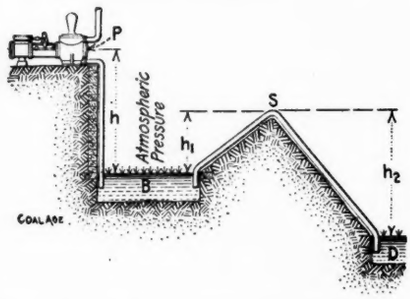
Questions are not answered unless accompanied by the name and address of the inquirer. This page is for you when stuck—use it

Siphoning and Pumping Hot Water

Can water at a temperature of 150 deg. F. be siphoned successfully? What are the limitations with respect to lift and horizontal distance, under ordinary conditions? Also, what is the limit of suction of a pump handling hot water, say water at a temperature of 150 deg. F., as compared with the lift of a pump handling water at 60 deg. F.? Can water, at a temperature of 200 deg. F. be pumped by an ordinary steam pump?

Johnstown, Penn. C. C. DOVEY.
General Superintendent.

In siphoning, as well as in pumping water, it is the atmospheric pressure acting on the surface of the water that forces it up the suction pipe against a vacuum. This is illustrated clearly in the accompanying diagram, where a pump and a siphon are both acting to drain the basin *B*. In pumping, a vacuum is created at *P*, by the action of the pump; in siphoning, a vacuum or tendency thereto is created at *S*, by the gravity of the water in the long leg of the siphon, which causes it to flow from the summit or crown *S* to the discharge basin *D*, leaving a more or less perfect vacuum at *S*.



VERTICAL SECTION SHOWING PUMP AND SIPHON AT WORK

The following table shows the atmospheric pressure and the safe suction head of a siphon, or pump, at different elevations above sea level, allowing 25 per cent. for frictional losses.

Elevation Above Sea Level Ft.	Atmospheric Pressure Lb. per sq.in.	Barometric Pressure In. Mercury	Temperature of Water Raised, Deg. F.					
			60	90	120	150	180	200
			Safe Suction Head for Pump (Ft.)					
10,000	10.107	20.582	17.0	16.4	14.7	11.3	4.7	0.0
5,000	12.224	24.890	20.5	19.9	18.2	14.8	8.2	1.2
4,000	12.689	25.837	21.5	20.9	19.2	15.8	9.2	2.1
3,000	13.169	26.813	22.4	21.8	20.2	16.8	10.2	2.9
2,000	13.665	27.824	23.2	22.6	21.0	17.6	11.0	3.7
1,000	14.174	28.861	24.1	23.5	21.9	18.5	11.9	4.6
Sea level	14.696	29.925	25.0	24.4	22.8	19.4	12.8	5.5
Tension of water vapor at various temperatures.....		Lbs. per sq.in.	0.255	0.693	1.683	3.706	7.500	11.5
		(In.)	0.518	1.410	3.427	7.547	15.272	23.457

The atmospheric pressure changes considerably and is different for different elevations. For example, at sea level, the normal atmospheric pressure is 14.7 lb. per sq.in.; while at an elevation of 10,000 ft. above sea level, the normal pressure is only about 10 lb. per sq.in. The vacuum established by a pump will depend on the character and perfection of the pump. The vacuum at the crown of the siphon is largely affected by the perfectness of the pipe joints. In each case, the vacuum is decreased by the air contained in the water lifted.

When handling hot water, the vacuum in a pump or siphon is decreased by the tension of the water vapor, which depends on the temperature of the water. The tension of water vapor is measured in pounds per square inch, or in inches of mercury column. When handling hot water and estimating the suction lift, the amount of this tension must be subtracted from the atmospheric pressure at the elevation of the pump or siphon.

The values of the suction head or lift given in this table are for a more or less vertical lift. When the suction pipe is much inclined, as is the case generally in a siphon, the greater length of the pipe naturally increases its frictional resistance, making it necessary to allow more than the 25 per cent. mentioned above. In this case, the length of the pipe and, consequently, the frictional resistance increases inversely as the sine of its angle of inclination. If we assume that, of the 25 per cent. losses, 10 per cent. is due to frictional resistance, since the frictional resistance increases with the length of the pipe, the percentage of frictional resistance, for an inclined pipe, is $\frac{0.1}{\sin A}$, A being the angle of inclination of the suction pipe.

Now, allowing 25 per cent. total loss, in a vertical lift, the available head is 75 per cent. The limit of length of the suction pipe, for any inclination A, on this basis, is found by making the frictional loss equal to the available head, in percentage; thus,

$$\frac{0.1}{\sin A} = 0.75$$

$$\sin A = \frac{0.1}{0.75} = 0.1333$$

and $A = 7° 40'$. On the assumed basis of percentage of frictional resistance, the limit of length of suction pipe, for any inclination, is practically 7.5 times the suction lift given in the table. Conditions may vary this factor, 7.5, 25 to 50 per cent., according to the condition of the pipe, number of bends, etc.

Motive Column

Explain the use of the term, "motive column" and give an example.

INQUIRER.

This term is chiefly used in furnace ventilation, for determining the ventilating pressure when the average temperatures and depth of the upcast and downcast shafts are given, respectively.

For example, assuming a barometric pressure of 30 in. and an average downcast temperature of 60 deg., upcast 180 deg. F., the pressure is found by first calculating the motive column in terms of either the upcast or downcast air, and multiplying this motive column by the weight of 1 cu.ft. of the same air.

Thus, in this case, the motive column, in terms of the downcast air, for a depth of 500 ft., is found directly by the use of the formula

$$M = \frac{180 - 60}{460 + 180} \times 500 = \frac{120 \times 500}{640}$$

$$= 93.75 \text{ ft.}$$

This being the motive column in terms of the downcast air, the ventilating pressure per sq.ft. is found by multiplying this motive column by the weight of 1 cu.ft. of downcast air, which is

$$w = \frac{1.3273 \times 30}{460 + 60} = 0.076575 \text{ lb.}$$

The corresponding unit ventilating pressure is then

$$p = 93.75 \times 0.076575 \text{ per sq.ft.} = 7.18 \text{ lb.}$$

Examination Questions

Selected from State Examinations, or Suggested by Correspondents

Examination Questions

Calculations in Splitting Air Currents

Ques.—Explain briefly the use of the expression $a\sqrt{\frac{a}{lo}}$, in calculating the natural division of air, in mine ventilation.

Ans.—The formula for ventilating pressure, in terms of the airway and the quantity of air passing is

$$p=\frac{klOq^2}{a^3}=k\left(\frac{lO}{a^3}\right)q^2$$

Since the pressure per square foot is the same for each split, p and k are constant and, for the several splits, q varies as $\sqrt{\frac{a^3}{lO}}$, or $a\sqrt{\frac{a}{lO}}$. This expression, therefore, (or its reciprocal, rather) indicates the resisting power of an airway.

Every airway, by virtue of the relation that exists between its sectional area (a) and its rubbing surface (lO), possesses a certain resisting power that determines the quantity of air that airway will pass, under a given pressure. The above expression, which indicates the resisting power of airways is properly called the *potential* of the airway.

Ques.—An air current of 100,000 cubic feet per minute is passing in a mine, in the following four splits: split A, 8x12 ft., 6000 ft. long; split B, 6x20 ft., 12,000 ft. long; split C, 6x12 ft., 8000 ft. long; split D, 4x6 ft., 1000 ft. long. Find the natural division of the air; also, the pressure and horsepower producing the circulation.

Ans.—The area, perimeter and length of each airway is as follows:

A,	$a=96$ sq.ft.;	$o=40$ ft.;	$l=6{,}000$
B,	$a=120$ sq.ft.;	$o=52$ ft.;	$l=12{,}000$
C,	$a=72$ sq.ft.;	$o=36$ ft.;	$l=8{,}000$
D,	$a=24$ sq.ft.;	$o=20$ ft.;	$l=1{,}000$

Reduced, the lowest relative values are

A,	$a=4$;	$o=10$;	$l=6$
B,	$a=5$;	$o=13$;	$l=12$
C,	$a=3$;	$o=9$;	$l=8$
D,	$a=1$;	$o=5$;	$l=1$

The relative split potentials are, now, found by substituting these relative values in the expression for potential;

A, $4\sqrt{\frac{4}{6\times10}}=4\sqrt{\frac{1}{15}}=4\sqrt{0.06666}=0.258$

B, $5\sqrt{\frac{5}{12\times13}}=5\sqrt{0.03205}=0.179$

C, $3\sqrt{\frac{3}{8\times9}}=3\sqrt{\frac{1}{24}}=3\sqrt{0.04166}=0.204$

D, $1\sqrt{\frac{1}{1\times5}}=\sqrt{\frac{1}{5}}=\sqrt{0.2}=0.447$

Sum of potentials..... 1.088

The quantity of air passing in each split is proportional to the split potential, and is found as follows:

A, $\frac{0.258}{1.088}\times100{,}000=$ 23,710 cu.ft. per min.

B, $\frac{0.179}{1.088}\times100{,}000=$ 16,450 cu.ft. per min.

C, $\frac{0.204}{1.088}\times100{,}000=$ 18,750 cu.ft. per min.

D, $\frac{0.447}{1.088}\times100{,}000=$ 41,090 cu.ft. per min.

Total quantity.. 100,000 cu.ft. per min.

Since the pressure is the same for all the splits, it can be calculated for any one of the given splits, by substituting the values for that split in the formula

$$p=\frac{klOq^2}{a^3}$$

Thus, taking split A,

$$p=\frac{0.00000002\times6000\times40\times23{,}710^2}{96\times96\times96}$$

$$=3.05\ lb.\ per\ sq.ft.$$

The horsepower on the air in the main entry, or the horsepower producing this circulation is, then,

$$H=\frac{Qp}{33{,}000}=\frac{100{,}000\times3.05}{33{,}000}=9.24\ hp.$$

Ques.—Find the pressure and the horsepower that will be required to produce the following distribution of the air in the four splits given in the last question:

Split A,	20,000	cu.ft. per min.
Split B,	40,000	culft. per min.
Split C,	30,000	cu.ft. per min.
Split D,	10,000	cu.ft. per min.
	100,000	cu.ft. per min.

Ans.—It is necessary, first, to find the natural unit pressure that will pass the required quantity of air in each split. Thus,

A, $p=\frac{0.00000002\times6000\times40\times20{,}000^2}{96\times96\times96}$

$$=2.17\ lb.\ per\ sq.ft.$$

B, $p=\frac{0.00000002\times12{,}000\times52\times40{,}000^2}{120\times120\times120}$

$$=11.55\ lb.\ per\ sq.ft.$$

C, $p=\frac{0.00000002\times8000\times36\times30{,}000^2}{72\times72\times72}$

$$=13.89\ lb.\ per\ sq.ft.$$

D, $p=\frac{0.00000002\times1000\times20\times10{,}000^2}{24\times24\times24}$

$$=2.98\ lb.\ per\ sq.ft.$$

Since split C has the highest natural pressure, it will be the free or open split and each of the other splits will require regulators to bring the pressure in each up to the natural pressure in split C.

The horsepower producing the required circulation is then found by multiplying the total quantity of air in circulation by the unit pressure or the pressure per square foot and dividing by 33,000.

$$H=\frac{100{,}000\times13.89}{33{,}000}=42.09\ hp.$$

Ques.—Calculate the natural division of 150,000 cu.ft. of air between the following three splits or airways: A, 6x10 ft., 3000 ft. long; B, 6x8 ft., 2400 ft. long; C, 5x9 ft., 3600 ft. long.

Ans.—The first step is to find the area, perimeter and length of each airway or split and reduce these to the lowest relative values; thus,

Split A, $a=6\times10=60$ sq.ft.; $o=2\ (6+10)=32$ ft.; $l=3000$ ft.

Split B, $a=6\times8=48$ sq.ft.; $o=2\ (6+8)=28$ ft.; $l=2400$ ft.

Split C, $a=5\times9=45$ sq.ft.; $o=2\ (5+9)=28$ ft.; $l=3600$ ft.

The lowest relative values are then found as follows: The areas, 60, 48, 45 reduced to 20, 16, 15; the perimeters 32, 28, 28 to 8, 7, 7; the lengths 3000, 2400, 3600 to 5, 4, 6.

The next step is to find the potential values for each split, by substituting the relative values found above for a, o and b in the potential $a\sqrt{\frac{a}{lo}}$; thus,

Split A,

$$20\sqrt{\frac{20}{5\times8}}=20\sqrt{\frac{1}{2}}=20\sqrt{0.5}$$

$$=14.142$$

Split B,

$$16\sqrt{\frac{16}{4\times7}}=16\sqrt{\frac{4}{7}}=16\sqrt{0.57143}$$

$$=12.094$$

Split C,

$$15\sqrt{\frac{15}{6\times7}}=15\sqrt{\frac{5}{14}}=15\sqrt{0.35714}$$

$$=8.964$$

Sum of relative potentials 35.200

The quantity of air passing in each split is then found as follows:

Split A,

$\frac{14.142}{35.2}\times150{,}000=$ 60,260 cu.ft. per min.

Split B,

$\frac{12.094}{35.2}\times150{,}000=$ 51,540 cu.ft. per min.

Split C,

$\frac{8.964}{35.2}\times150{,}000=$ 38,200 cu.ft. per min.

Total.... .... 150,000 cu.ft. per min.

Coal and Coke News

From Our Own Representatives in Various Important Mining Centers

Washington, D. C.

News that a serious coal shortage is actually impending has been received here with extreme regret by officials of the government. They believe that should such a shortage lead, as it is stated will be the case, to an advance in prices, the effect will be a demand for legislation of a radical character next winter and that this demand will be so strong as not to be resisted.

The developments of the past session showed that there was great restiveness among consumers and the community in general, not only with reference to the increasing cost of living, but also with respect to the advances in the price of hard coal particularly. The higher cost of coal led to the passage of the Difenderfer resolution which called for an investigation of the coal situation, which is now in progress.

Enough has now been done to show that the report on the coal outlook is likely to be ready by the middle of the next session and if rumors concerning what has been thus far ascertained are correct, the results of the inquiry will not prove a sufficient warrant for the advances, so far, at least, as congressional opinion is concerned.

Likely Results of Increase in Prices

Several types of legislation are already talked of as likely to result from the increase in price which appears to be contemplated. One is the immediate removal of all duties upon coal, and this will almost certainly be provided for by the Democrats should they come into power. Not a few Republicans are likewise committed to the removal of the coal tariff just as they are to the removal of the duties on meat.

A second line of action of which much is likewise heard is the undertaking of an extensive investigation into conditions existing in the hard-coal regions with a view to ascertaining exactly how far the railroads are responsible for advances in price, and for the further purpose of securing recommendations as to means of cutting the large profits generally asserted to be drawn from the coal business.

There is also a tendency to investigate a good many detached incidents of price-raising or combination in connection with the mining and selling of anthracite for the purpose of showing that the price is maintained by combinations of operators, railroad interests, etc.

The various provisions for arbitration controversies in the coal regions in order to avoid strikes and apportion the responsibility for advances in price of the article had been brought forward before the present agitation as to advances in coal prices had become so marked, but are closely connected with the same subject, and will be stimulated by the effort to put the retail price up to a permanently higher figure.

It is hoped by those who do not want to see Congress enter this field of agitation and legislation that no increase in price will be attempted at this particular juncture, if it ever is. Officials are known to have taken a serious view of the subject in some of their recent conversations with members of the trade.

Report of Census Bureau

The census bureau has at last completed and made public its report on the mining industry, but has not yet finished the detailed report on coal, stating that some additional time will be necessary to get results in connection with the latter subject. The report on mining, however, gives some general figures regarding the production of coal which are of interest.

Experimental Mine Explosion

The first practical experiment in blowing up a mine with gas is to be made Sept. 20, when the government experiment mine at Bruceton, Penn., will be exploded under the direction of government mine experts.

Two days after the explosion investigations will be made to gather information for the prevention of mine disasters. Invitations have been issued to congressmen, mine operators, workers and delegates to a large convention of mine experts of America and England which will be in session at Pittsburgh at that time.

Alabama

Bessemer—The Tennessee Coal, Iron & R.R. Co. is preparing to blow in its bessemer No. 4 furnace.

A large tonnage of pig iron has been sold up to the first quarter of next year.

Birmingham—It is reported that an effort will be made to revive the plan to merge the Alabama Consolidated Coal & Iron Co. and the Southern Iron & Steel Co. This plan was abandoned some months ago.

Certain capitalists of Baltimore, who are largely interested in the Alabama properties, look with favor upon the proposition.

It is understood that legal proceedings are to be instituted against the officials of the Abernant Coal Co., charging them with the responsibility for the recent mine disaster at Abernant.

It is alleged that several sections of the mining laws of the state had been violated, and, as a result, the explosion occurred, costing the lives of 17 negroes.

In an official statement issued yesterday, J. B. McClarry, president of the Abernant Co., disclaims any knowledge of an intimated investigation, and is surprised to learn that the company has been found responsible.

Seventeen hundred shares of the common stock of the Alabama Consolidated Coal & Iron Co. were sold at auction Aug. 30.

Mobile—It has been announced that two colliers are to be constructed at a cost of $100,000 by the Pratt Consolidated Coal Co.

Colorado

Crested Butte—The Colorado & Elk Mountain Coal Co. is one of the new mining enterprises in this vicinity. The company owns 200 acres of land, which is underlaid by three distinct beds of coal of fine quality, aggregating a thickness of 30 ft.

The company will soon begin building an aërial tramway to convey the coal from the mine to the railroad. A tunnel 40 ft. long has been pushed into the mountainside and shows a solid wall of good bituminous coal for the entire distance.

Walsenburg—The contract has been let for the sinking of a 450-ft. shaft at the Mutual Coal Co.'s new prospect west and south of this city. It is expected that the shaft will be finished by the first of the year.

The mine is located in the heart of the Walsenburg district, and, according to official reports, show signs of being a great producer.

Illinois

Decatur—Nearly a thousand miners employed in the four coal mines at Pana have gone on strike on orders from a sub-district official. He states that the operators are not keeping their part of the agreement recently made.

Carlinville—All records in this part of

the state for hoisting coal were broken recently, when mine No. 3 of the Superior Coal Co., near Gillespie, recorded an output of 4543 tons and 1300 lb. of coal for an eight-hour day.

Lovington—The Lovington Coal Mining Co. is now working 50 men in two shifts. The output of the mine is about 300 tons at the present time.

The main entry, which has been sealed up for two weeks, will probably be opened some time this week. The output before the fire was 450 tons.

Indiana

Jasonville—The R. Fry mine has closed down for an indefinite period and 150 men are out of work as a result. The trouble arose over the taking out of what is known as low coal. Operators had been paying $1 per ton for such work, but the men demanded a scale price of $1.03. This, the operators claim, they cannot pay and still get the coal out at a profit. Rumor has it that the company will abandon the mine rather than pay the demand.

Arrangements are being made to open the Vandalia mine No. 8, and the Little Giant mine now owned by the Monon Coal Co. These two mines will give work to at least 600 men and every unemployed coal miner in this district will be put back on the job. The mines have been shut down since last April.

The next meeting of the Indiana Mining Institute will be held Oct. 4, 1912. A paper will be re-read by Robert Collins, department mine inspector. Another paper will be read by Frank Pearce, also department mine inspector, and will have for the subject, "Accidents in Mines from Fall of Roof."

Secretary John Sutton extends a cordial welcome to all mine inspectors, firebosses, and any others who are interested in the discussion of mining problems to be present.

Montgomery—Prospectors on the Mike Desser farm have struck a 5-ft. bed of coal. The coal was found at a depth of 100 ft., and is said to be of excellent quality.

Terre Haute—The Vandalia Coal Co. has begun preparations for extensive mining in this section. They own the coal under about 5000 acres of land near West Terre Haute. Their first work will be to reopen the old Leggett mine.

Rumor has it that the Indiana United Mine Workers have named Frank I. Pearce, state mine inspector, as their arbitrator of the question recently raised at the mines of Consolidated Coal Mining Co. J. W. Paul, of the federal government mine bureau, at Pittsburgh, has been named by the Indiana operators. The principal bone of contention is the use of carbide lamps by the miners.

Iowa

Woodward—A new coal mine is being opened in this vicinity, and it is said to be a venture that promises well for the town.

Kentucky

Lexington—Alleging that the rates charged for transporting coal to Lexington from eastern and southern Kentucky mines are unjust and discriminatory, the Lexington Commercial Club has requested the State Railroad Commission to investigate the complaints some time in September. The roads who are complained of include the Louisville & Nashville, Chesapeake & Ohio and Cincinnati, New Orleans & Texas Pacific railroads. It is alleged that the rates to Lexington are higher than those in effect to Louisville, and that the relative proximity to the mines does not justify such discrimination.

Proctor—Lock and dam No. 14, near the mouth of Sturgeon Creek on the upper Kentucky River, will be completed late in the fall and will give slack-water navigation to Beattyville and Proctor the year around, and will enable Clark County operators to move coal daily. The needle dam at Beattyville, which was partly washed out several years ago, will be replaced by the Government next year and will give slack-water navigation up each of the three forks for several miles, opening up a coal territory which has long lain dormant.

Koes Run—Disquieting reports received from Bath County, Ky., which is the scene of a strike, may result in the dispatch of militia to that place. About 150 employees of the Roes Run iron mines are striking for an advance in wages. G. Connor Ewing, county attorney of Bath, has conferred with Gov. McCreary as to the advisability of calling on the state troops. Several men have been shot from ambush since the strike began in mid-summer.

Whitesburg—D. F. Wallace, representing a Cincinnati corporation, has just closed a deal on 5000 acres of rich coal land lying along Rock House and Mill Creek. The price per acre is said to have been $50.

The property is underlaid by two or more seams of fine coking coal, measuring 6 to 8 ft., without a parting.

It is said that this concern will soon start development work on this property, and will probably spend thousands of dollars.

Whitley City—Northern capitalists will soon begin to drill a hole for the purpose of testing the coalfields just north of this city. The drilling will be done with what is commonly called the core drill.

In this way each formation and mineral deposit is brought forth in its original condition for examination.

If this deal shows up well, when drilled, a shaft will be sunk, and a large operation will be started.

Massachusetts

Boston—At the meeting of the New England Retail Coal Dealers' Association, adjourned from Aug. 21 and held Sept. 4, President William A. Clark and Secretary Charles H. Haskell made their report on the anthracite situation, which they had been directed to investigate. They said they had received assurances of good faith from officials of the originating and distributing companies and that, when the big grain crop starts to move East, coal shipments West would be curtailed and a larger volume might be expected for New England.

A serious car shortage was predicted and the general drift of the report suggested that, while the outlook was grave, yet, by using their influence with the public and by piecing out their customers with small supplies from time to time and treating all alike, the dealers in most places might handle the situation without distress to the people. The attitude of the meeting was much milder toward the distributing factors and the clenched fist was less in evidence.

Missouri

St. Louis—A coal mine has begun operations in a recently discovered seam in Forest Park.

A bed of high-grade bituminous coal has been found on the spot where the United States Government Building stood at the World's Fair.

Donk Bros. Coal Co. has purchased ground and established yards on Kings Highway near Rosalie Ave. The company's new depot will embrace a frontage of 300 ft. on the Belt Line.

Ohio

New Waterford—Steps have been taken toward raising funds for the purpose of sinking the first shaft in the development of a prospective coal mine on 800 acres of land along Bull Creek.

This amount is to be raised by the citizens, while an organized company will install electrical equipment valued at $25,000, to operate the mine, supply electric current to light the village and furnish power for other manufacturing plants.

It is estimated that between 300 and 400 miners will be required to operate the mine when work is under headway.

Pennsylvania

ANTHRACITE

Larksville—The coroner's jury that investigated the case of the two men who were killed in the accident at the No. 2 colliery of the Delaware & Hudson Co. have returned the following verdict:

We, the jury in the case of John Mc-

Guire and Michael Morrissey, who met their death July 24, find the Delaware & Hudson Co. negligent in the performance of its duty in not having the old workings fenced off and for not having an attendant at the main door in compliance with the mine law of the State of Pennsylvania.

Pittston—Captain May, of the Hillside Coal & Iron Co., and a party of officials made a trip of inspection of the collieries in this section last week.

An inspection of the company's collieries is made annually. Ratings are given each colliery, the foreman having his mine in the best condition receiving the highest mark. Where it is thought the coal could be mined easier, or where other changes are deemed beneficial, suggestions are made by the inspectors.

Employees from No. 9 colliery of the Pennsylvania Coal Co., who have been on strike, have decided to return to work. This colliery employs about 1500 men and boys who have been idle for a week on account of the two new men who were appointed check weighmen and mine boss not being allowed to perform their duties.

BITUMINOUS

Bolivar—The work of laying the track on the new siding of the Lacolle Coal Mining Co. is progressing rapidly. Rails have laid a considerable distance above the bridge and a train of cars have been run up as far as Crusan's cut.

If weather conditions are favorable the present force ought to have the track laid up to the mine by this week. The work of building the concrete piers and foundations for the power house is also nearly completed.

Connellsville—Sulphur mud from the Davidson mines of the Frick Co. is to be shipped to a Pittsburg paint manufacturing concern for a test as a paint ingredient, and will be the first of the kind from the Connellsville region.

It is probable that the Superba Coal Co. will begin shipment of coal from the new slope of No. 2 mine at Evans Station, which was flooded July 24, this week. The water has been entirely removed from this portion of the workings.

The H. C. Frick Coke Co. is making extensive alterations at the Lemont, Youngstown & Colebrook mines to prevent further damage by floods.

All openings at the two Lemont and Youngstown mines are being raised 5 ft. above the highest water mark recorded in the last flood. Surface openings or cracks in the earth above the mines are being covered to prevent seepage. The Lemont mine is operating now at full capacity, but it will be several days before all the water is removed from the Youngstown mine.

The jury has returned the following verdict in regard to the flood at the Lemont mine:

We find from the evidence presented that the flooding of the Lemont mine was caused by the excessive rainfall, which caused Cove Run to back and overflow its bank with sufficient rapidity to allow the water to flow into the manway into the mine; that when the danger was discovered, every effort was made to prevent the water from entering the mine; that the miners were notified at once, as soon as the danger was discovered. These were unusual circumstances over which no one had control and for which no man can be censured.

DuBois—The difficulties between the men and the company at D. & F. shaft No. 2 have not yet been adjusted. As a result, the men have resolved to stay out until Walters, who had been doing extra spragging and was refused any more of that kind of work, has been relieved of the ban.

Johnstown—About 1000 miners were idle Sept. 3, and the railroad and trolley lines were put out of commission by a cloudburst along Black Lick Creek in northern Cambria County.

Pittsburg—It has been rumored that one track of the Panhandle R.R. has been opened as far as Colliers.

The railroad company has a force of about 2000 men at work in the Farman Creek valley and as soon as the bridge can be swung in place, the line will be opened.

Tennessee

Nashville—J. W. Gascho, of Indiana, has bought 12,000 acres of coal and timber land in Franklin County, near the Alabama border. It is expected that he will develop the coal land.

Texas

I. J. Broman, state mine inspector, has issued his report in which he says:

During the year there were 43 mines in operation, of which 15 were bituminous and 28 lignite mines. . . . The total output approximated 1,968,155 tons. . . . . As regards safety, I consider the coal mines in this state almost as safe as such mines can be made: they will compare favorably in any instances with the best coal mines of other states.

Virginia

St. Charles—The property of the Dominion Coal Co,, which has been in the hands of Receiver Bennett for several months, was sold at auction, Aug. 30. The property of the company included two seams of choice coal, several openings and one tipple.

Washington

Seattle—The committee representing the coal-mine workers of the State of Washington after nearly a month of negotiations have reached a wage agreement with the operators, removing the probability of a strike and consequent coal shortage.

The mine workers say they gained almost everything they asked, including an advance in wages in excess of 5 per cent., and a bi-weekly pay day. The agreement was to be submitted to the miners' convention today and was expected to be ratified immediately.

West Virginia

Colliers—The mining town of Colliers, with about 800 inhabitants, was totally destroyed by a cloudburst Sept. 2. The town is the division headquarters for Panhandle R.R. Co.

Wheeling—Disarmed by the militia, the 200 mine guards employed by the coal operators at Paint Creek are departing for their homes today. Order has been restored as a result of the martial law.

At Keeferton and Mahan, 300 more miners have gone on strike. This is outside of the military district and trouble is feared.

England

Birmingham—The twenty-third annual general meeting of the Institution of Mining Engineers of Great Britain was held at Birmingham, on Sept. 11, and visits of inspection to various works of interest in the locality were made on the 12th and 13th. The following papers were read, or taken as read: "Recent Legislation as regards Lands and Mines," and "An account of Explosions in the Bellevue Mines, Alberta."

The Birmingham University buildings, where the business meeting was held, the Earl of Dudley's Round Oak Works, and the Baggeridge Collieries were inspected, while a pleasant excursion to Cadbury's Chocolate Works and the Shakespeare country were enjoyed by the ladies.

France

PAS-DE-CALAIS

Lens—Sixty-one persons including rescuers were killed by an explosion of firedamp on Sept. 3 in the Clarence coal mine in the Département du Nord.

Seventy-three men were working in the pit at the time. Rescue operations were started at once, but the work proved most difficult as the passages of the mine were filled with a dense black vapor and the walls were continually collapsing.

Up to nightfall the rescuers had taken out three dead bodies and 23 living men. All those rescued alive were fearfully burned. Only ten miners, who were working near the mouth of the shaft, escaped uninjured.

Although the rescuers have not relinquished their work, the further they penetrate, the more choked up they find the passages, showing that the explosion was terrific. Two men were working in a remote part of the pit and the officials of the mine believe that it will be impossible to save either of them.

Personals

H. F. Mikesell has been appointed assistant to the manager of mining department of the Rock Island Line, Sept. 2.

W. L. Knox has resigned his position as mine boss with the Crawford Coal Co., of Brazil, Ind., after having served in that capacity for nearly 21 years.

E. T. James, superintendent of the shops and power house of the Lehigh Coal & Navigation Co., has been made president of the Mauch Chunk Iron Works, at Mauch Chunk, Penn.

A. E. James is secretary and treasurer of the Mauch Chunk Iron Works. He was formerly shop demonstrator for the Lehigh Coal & Navigation Co.

According to the rules of the Philadelphia & Reading Ry. Co., G. F. Baer, president, will cease to be the active head of the railroad and coal properties when he reaches his 70th year, on the 26th of September.

At a meeting of the creditors of the Southern Iron & Steel Co., J. H. Bowron, formerly receiver for the company, was elected trustee to take charge of the company trusteeship until the bankrupt case is wound up.

P. J. Rogers, of Ensley, Ala., superintendent of Pratt No. 1 Coal-Mine Division of the Tennessee Coal, Iron & Railroad Co., left, on Monday, Sept. 2, for Baltimore, to be operated on at John Hopkins Hospital for kidney trouble, with which he has been suffering for some months.

William Housman, of Birmingham, Ala., has resigned his position as mechanical engineer for the Pratt Consolidated Coal Co., effective Sept. 15, 1912, to accept position as assistant to C. M. Blanchard, representing the Jeffrey Manufacturing Co., of Columbus, Ohio, with headquarters in the Brown-Marx Bldg., Birmingham, Ala.

B. W. Robinson, a well known mining expert, has accepted the management of the Victoria Coal Co., of Victoria, Ky. Mr. Robinson formerly was general manager of the St. Bernard Mining Co., Earlington, Ky. Since resigning that position, he has had charge of important mining operations for the Mexican government and for railroad interests in Mexico.

T. G. Fear, superintendent of the Whitwell mine of the Tennessee Coal, Iron & R.R. Co., at Whitwell, Tenn., was transferred, Sept. 1, to the Birmingham district as superintendent of No. 16 Pratt mine. The construction of this mine is just being started at a point on the Birmingham Southern R.R., to be called Bayview, about six miles beyond Wylam, Ala. Mr. Fear was succeeded at Whitwell by William A. Meagher, mine foreman of Mulga Mine, of the Woodward Iron Co.

Recent Coal and Coke Patents

Coke Conveyer. D. F. Lepley, Connellsville, Pa. 1,033,713, July 23, 1912. Filed May 17, 1910, Serial No. 561,864.

Manufacture of Producer Gas. J. A. Singmaster, Palmerton, Pa. 1,033,127, July 23, 1912, Filed Sept. 20, 1910. Serial No. 582,827.

Gas Producer, J. B. Nau, New York, N. Y. 1,033,611, July 23, 1912. Filed April 8, 1912. Serial No. 689,249.

Load Handling Apparatus. R. F. Bennett, Portland, Me. 1,033,078, July 23, 1912. Filed April 14, 1909. Serial No. 489,926.

Apparatus for Loading and Unloading Coal. F. W. Lovell, assignor to McMyler Mfg. Co., Cleveland, O. 1,033,602, July 23, 1912. Filed Oct. 9, 1908. Serial No. 456,857.

Mechanical Stoker. E. H. Peabody, assignor to Babcock & Wilcox Co., Bayonne, N. J. 1,033,192, July 23, 1912. Filed April 6, 1906. Serial No. 310,276.

Door for Coke Ovens. W. O. White, Uniontown, Pa. 1,034,328, July 30, 1912. Serial No. 592,058.

Charging Machine for Coke Ovens. W. Feicks, Bethlehem, Pa. 1,034,094, July 30, 1912. Filed March 9, 1911. Serial No. 13,464.

Gallery Frame for Mines. W. Binder, Altenessen, Germany, 1,034,065, July 30, 1912. Filed Feb. 15, 1910. Serial No. 544,024.

Drill for Rock, Coal and Other Material. S. S. Wyer, assignor to Jeffrey Mfg. Co., Columbus, O. 1,034,052, Filed Jan. 14, 1905, Serial No. 241,076.

Horizontal Coke Oven of the Re-generative Type. E. Hohmann, assignor to Stettiner Chamotte-Fabrick Actien-Gesellschaft vorm, Stettin, Germany. 1,034,709, Aug. 6, 1912. Filed Feb. 24, 1910. Serial No. 545,633.

Ore Car. F. Seaberg, assignor to National Dump Car Co., Chicago, Ill. 1,035,389, Aug. 13, 1912. Filed, Jan. 12, 1909. Serial No. 471,835.

Process of Manufacturing Artificial Coal. J. Leach, Sheppton, Pa. 1,035,452, Aug. 13, 1912. Filed June 20, 1910. Serial No. 567,958.

Ore Crusher. B. W. Traylor, assignor to Traylor Eng'g & Mfg. Co., a corporation of Delaware, 1,035,273, Aug. 13, 1912. Filed Nov. 23, 1911. Serial No. 661,888.

Industrial News

The Mauch Chunk Iron Works, formerly operated by the Stroh Estate, resumed operations on Sept. 3, 1912.

The company has been reorganized and will manufacture a general line of grey iron castings for all classes of service; they will make mining, quarry and factory machinery, and will manufacture all kinds of special machinery from plans furnished or design same when required; they will also do a general line of repair work.

Obituary

Gomer Thomas, former state mine inspector of Utah, died in Salt Lake City, Sept. 2, at the age of 68 years.

His health commenced failing shortly after the coal-mine explosion at Scofield, in 1901, in which he sustained a slight injury. The direct cause of his death was liver trouble.

Publications Received

IGNITION OF GAS BY MINIATURE ELECTRIC LAMPS WITH TUNGSTEN FILAMENT. By H. H. Clark. Technical paper No. 23, U. S. Bureau of Mines.

PRACTICAL FIELD GEOLOGY. By J. H. Farrel, E. M. Including a guide to the sight recognition of 120 common or important minerals. By Alfred J. Moses, E. M., Ph.D. Flexible morocco cover. 273 pp., 4¾x7½ in., 59 fig., 7 half tones, 4 tab. Published by the McGraw-Hill Book Co., New York City. Price, $2.50, net.

The keynote of this book is practicality. In past years, books on geology have dealt with results, but have neglected to say anything about the methods employed to arrive at them. Many mining men today realize the lack of accurate geological data on their maps.

The idea of this book is, therefore, to set forth simple, rapid and practical methods of collecting and recording such data. The methods described are used by the U. S. Geological Survey in their rough determinations. It is pointed out that the plane table is of great value in work which does not require the greatest degree of accuracy.

In describing topographic and geologic mapping, the shortest cuts are mentioned. Stadia work is given its share of attention. As a rule, the derivation of formulas has been omitted. This is a good thing, for, after all, formulas are only a necessary nuisance. In practical work, it makes no difference if a man does, or does not, know how to derive a formula. What he must know, however, is where to find the formula he wants, and how to apply it. Such is the spirit of the new book.

Prof. A. J. Moses, of Columbia University, has contributed a guide to the sight recognition of 120 common or important minerals. Professor Moses is an authority of national repute on this subject, and his tables are the most concise, uptodate and intelligible published in recent years.

An appendix contains definitions of the principal technical words used in geological parlance, lists of outfits for topographic mapping and drafting, for geologic mapping, both surface and underground, personal and camp outfits required for a four-man party, and a list of rations to supply four men two weeks.

The book is of a convenient size and may easily be carried in a coat pocket. It has a flexible morocco cover, with rounded corners. The illustrations are abundant and to the point. Wherever the author has decided that an illustration would make his point clearer, we find an intelligible cut.

On the whole, this is a "real" book—one which supplies a long-felt need in the field of geology. It is meant for the use of the practical man, not for the scholar who likes to delve in geological research. We commend it to our readers.

Coal Trade Reviews

Current Prices of Coal and Coke and Market Conditions in the Important Centers

General Review

While the bituminous production is quite heavy no surpluses are reported at the large distributing centers. The line and Western trade on Pocahontas and New River especially, is quite brisk; this has caused a shortage in the Eastern markets where only sufficient is being sent to meet contract obligations. Current shipments are going into immediate consumption and no supplies of any grades are being accumulated.

The situation in anthracite still continues hard and companies are taking the stand that they can look after none but old customers. Coast dealers are down to a hand-to-mouth business, and the demand still exceeds the supply as far as ever. The investigations conducted by the New England Retail Coal Dealers Association has resulted in a more conciliatory feeling toward the companies, and it is now believed that they are dealing with a hard situation and handling it in the best possible manner.

In the Pittsburgh district the demand has improved and prices are stiffer, but quotations have not advanced; the usual advance to the winter schedule on domestic has gone into effect, but all important tonnages are covered by contracts. Shipments are up to the maximum rate for the period. Eastern dealers generally, claim they have more business than they can handle and that the year promises to be a prosperous one.

The coal shortage in Ohio still continues to be the predominating feature in the trade there. Dealers in all sections are stocking heavily, the domestic grades are steady and the volume of business is quite good. The car shortage is interfering with Lake shipments, but the movement is quite heavy and the indications are that it will continue so until the end of the season. The general tone is satisfactory and the recent advances in quotations are being well maintained.

The dumping at the Virginia piers for August shows some increase over July. There are no accumulations at the piers and few shippers have any surpluses. In the Middle West operators are hesitating to quote prices and refusing entirely to contract for any large tonnages; the demand for all grades is unusual. At St. Louis, where the trade has been particularly slow, prices are now advancing in spite of the warm weather.

Boston, Mass.

Bituminous continues firm, although there were no special developments the past week. While the output is normal for the season no surplus is reported at any of the terminals, and at Hampton Roads there is occasional slow loading on account of the lack of coal. The line and Western trade is reported brisk on Pocahontas and New River and that leaves for tide only a sufficient tonnage to care for commitments that were made some months ago. The export market is also calling for more than its usual quota from Hampton Roads. The agencies are all short of new business and no spot market of any consequence has appeared so far. Prices for inland delivery at this end rule a little higher as cargoes are absorbed.

On Georges Creek and the Pennsylvanias, orders are well up to the receipts at the loading piers. Consumers, large and small, are keeping after the contractors to furnish the stipulated amounts each week or month, and it is generally felt that most of the current shipments are for immediate consumption and a relatively small proportion only for reserve. All-rail, the summer prices on Pennsylvania bituminous grades have been withdrawn for the most part and the movement is steady on season orders. With the advanced prices at tide there is already an enlarging market for spot coal all-rail.

Water freights are firm at 95c.@$1, or 25@30c. higher than in July, Hampton Roads to Boston.

There is no material change in anthracite save that the suspension over pay day and Labor day meant a further loss of output. The originating companies and some of the older middle houses have now taken the position that they cannot look after any but old customers. With some of the shippers, stove size is eliminated from all orders, and egg has lately been in short supply. The dealers along the coast are doing only a hand to mouth business as coal is coming forward so slowly that they are not warranted in obligating themselves for the winter months.

The adjourned meeting of the New England Retail Coal Dealers Association in Boston, on Sept. 4, is reported to have shown a more conciliatory and tolerant spirit than the first meeting a fortnight ago. While there are doubtless exceptions, the feeling is spreading that the companies are contending with a hard situation in every quarter and that they are dealing as fairly as they can with their New England customers. There is much talk over the premiums rumored to have been asked and paid for spot shipments of anthracite, both all-rail and at tide.

Current quotations are about as follows:

Clearfields, f.o.b. mine	$1.10 @ 1.35
Clearfields, f.o.b. Philadelphia	2.35 @ 2.60
Cambria County, South Fork, etc., f.o.b. mine	1.25 @ 1.60
Somersets, f.o.b. mine	1.30 @ 1.50
Somersets, f.o.b. Philadelphia	2.55 @ 2.75
Pocahontas, New River, f.o.b. Hampton Roads	2.70 @ 2.80
Pocahontas, New River, on cars, Boston	3.90 @ 4.00
Pocahontas, New River, on cars Providence	3.75 @ 3.95
Anthracite stove, f.o.b. New York	5.30 @ 0.00
Anthracite egg, f.o.b. New York	5.20 @ 5.75

New York

Bituminous—The demand at this point is rapidly becoming stronger and the trade better all along the line. While inquiries are becoming more frequent, consumers are showing some hesitancy about entering the market because of the recent advance in quotations.

There are no increases in the stocks at tidewater and a number of companies are getting seriously behind on orders. The heavy floods in Pennsylvania curtailed shipments, and the labor situation at the mines there, as well as in West Virginia, is seriously interfering with the production. The manufacturing demand is picking up rapidly and the general tone of the trade quite firm.

Prices on some grades have advanced over those quoted last week, as follows:

West Virginia, steam	$2.45@2.55
Ordinary grades Pennsylvania	2.55
Fair grades, Pennsylvania	2.60@2.70
Good grades, Pennsylvania	2.75@2.80
Best Miller, Pennsylvania	2.95@3.05
Georges Creek	3.30

Anthracite—The urgent demand for hard coal continues unabated with some sizes practically out of the market or obtained only at a heavy premium. In view of the heavy and unusual demand at this period of the year, it is interesting to consider what the situation will be when the customary winter activity sets in. The large distributors are unanimous in the belief that there are strong probabilities of distressing conditions and a spectacular market before the winter is over.

Because of the adverse market conditions at this point, many of the dealers are inclined to believe that New York is not receiving a fair proportion of the

production. It seems unlikely, however, that such is the case, and were an investigation made, it would probably end with a more conciliatory attitude toward the operators, as was the case at Boston.

Quotations continue to advance and are now as follows:

	Upper Ports	Lower Ports
Broken	$5.00	$4.50 @ 5.00
Egg	5.25	5.20 @ 5.90
Stove	5.25	5.20 @ 6.00
Nut	5.50	5.20 @ 6.00
Pea	3.50	3.35 @ 3.60
Buckwheat	2.75	2.25 @ 2.50
Rice	2.25	1.95 @ 2.05
Barley	1.75	1.60 @ 1.70

Pittsburgh, Penn.

Bituminous—Demand for coal has improved somewhat all along the line, and prices have continued to show a slight stiffening tendency, though our quotations are not advanced further. Shippers who cater particularly to the retail trade have marked up their asking prices as usual at this time, to the winter schedule, but all the important tonnage business had already been placed under contract. Shipments are fully up to the maximum rate of the year. Car shortage is not pronounced, but is felt to an extent at most mines.

We continue to quote: Mine-run and nut, $1.05@1.10; ¾-in., $1.25; 1¼-in., $1.35; slack, 60@70c. per ton at mine, Pittsburgh district.

Connellsville Coke—The market on prompt furnace coke has stiffened about five cents a ton on the basis of actual sales, which have been made during the past week at $2.30 and in some cases at $2.35, while one lot, of a specially desired brand, sold at $2.40. The sales were all for prompt shipment or shipment during the remainder of the month, and amount to about 15,000 tons. Some contract business has been under negotiation, but nothing appears to have been closed, and it is possible the furnaces now operating, which are not provided with contracts, will continue to buy from time to time for the balance of the year instead of making contracts.

There is some talk of contracts running to July 1, 1913, but buyers and sellers are hopelessly far apart in this case. We quote: Prompt furnace, $2.30@2.35; contract furnace, $2.35; prompt foundry, $2.40@2.50; contract foundry, $2.40@2.75.

The *Courier* reports production in the Connellsville and lower Connellsville region in the week ending Aug. 31 at 371,915 tons, an increase of 3000 tons, and shipments at 3815 cars to Pittsburgh, 6284 cars to points west and 933 cars to points east, a total of 11,032 cars, a decrease of 65 cars.

Philadelphia, Penn.

This district is becoming uneasy on account of the various articles in the newspapers as to the possibility of a coal shortage, and the dealers are being flooded with anxious inquiries as to whether there is any foundation for it. The fact that the dealers cannot begin to get enough coal to supply the demands, lends color to the statement that there is likely to be a serious condition in the anthracite industry in the near future.

As a matter of fact, there is a great shortage at the present time, confined mostly to the domestic sizes. Of course, this is the worst in the stove size, and it is understood that dealers are compelled in some cases, especially when it is new business, to turn down orders. Individual operators are reaping a harvest just now. It is reported that as high as 50c. premium has been offered and refused on stove and chestnut.

Prices ruling at present on the line are: Egg, $3.75; stove, $4; chestnut, $4.15. It is easy from this to figure what price some of the operators are receiving for their output at the mines. New prices have been announced by the retailers as follows: Pea, $5.50; egg, $7; stove, $7.25 and chestnut, $7.50, with 25c. off for cash. There seems to be an upward trend in the demand for the stove size. The difference of 25c. per ton in the price between this and chestnut is manifestly responsible for some of this, but many of the new houses have been equipped with furnaces that obtain the best results by the use of the stove, which also accounts, in a measure, for the heavy requisitions.

In the bituminous trade, better prices are being asked and received. The better grades, are bringing anywhere from 25 to 30c. per ton over figures of a month or two past, and there is a general upward tendency in the others.

Baltimore, Md.

With more coal moving under contract and a daily increase in spot business, the trade here is better than it has been for months. The demand during the week just ended has been far greater than the supply, and the result is that prices have advanced. There is not a ton of low-grade coal that can be had for less than $1, which is from 5 to 10c. higher than was paid the week previous, and there has been a corresponding increase in the higher grades; even the price of slack advanced from 15 to 20c.

All the operators in Baltimore could have doubled their output during the week had the car supply been adequate. Every mail brought letters from consumers, receiving coal under contract, instructing the operators to increase their deliveries. In some instances this was done, but in others, the requests could not be complied with.

The trade believes that the present activity in the market is going to continue indefinitely. The impression is that the consumers now realize the seriousness of the situation and are endeavoring to stock up.

Buffalo, N. Y.

The bituminous coal dealers say they have all the business they can do, and some of them are expressing conviction that the year will prove as profitable as 1907, which was about the last of the really big years in that trade.

The warm weather is not favorable to coal selling, but the demand does not seem to be retarded, so it is the general belief that when the cool weather arrives there will be more orders than can be filled. There is also the car shortage which will add to the general stiffness of the trade soon. So far this has not had much influence, but certain railroads are joining the shippers in urging buyers to get in their stocks early, as it is felt that in a short time the roads will be unable to take care of the business.

There has been much delay at all the Pennsylvania bituminous mines lately, on account of high water. The rains in that section have been quite heavy and in some instances the operation of the roads has been suspended by landslides and washouts, not all of which are yet cleaned up.

There are not yet many reports of advances in the price of bituminous. Full quoted prices are easily obtained, but as a rule not more than 5c. premium is reported, though more is expected as soon as the strictly fall trade sets in. Prices are strong at $2.57½ for Pittsburgh three-quarter, 2.47½ for mine-run and $2 for slack, the former weakness of Pittsburgh slack not being so apparent as it was a month ago.

Coke is now fairly leading the market in firmness, after being weak all the early part of the year, prices being based on $4.50 for best Connellsville foundry. Scarcity of labor in the coke regions has much to do with this.

The anthracite situation is unchanged. Even in this hot weather the demand exceeds the supply as far as ever. At the independent anthracite mines, arrangements are being made to work a night shift. The week's shipment of anthracite from Buffalo is 150,000 tons, a big average.

Columbus, Ohio

The coal trade in every part of Ohio has been quite active during the past week. There were two holidays in the first part which had the effect of bettering the car supply for the other four working days. The alarming feature of the business is the growing car shortage and railroad, as well as coal men, believe there is no relief in sight.

The domestic demand rules steady and the volume of business is still good despite the temporary lull which always follows an advanced circular. Dealers in all parts of Ohio, Indiana and Michigan are stocking up some; it is feared that

the growing car shortage will make it difficult to get Hocking lump shipped promptly. There is considerable trade from the larger private consumers and dealers in most parts of the state are busy making deliveries.

The lake trade rules active although congestion is reported on the docks of some of the upper lake ports. The car shortage is interfering with the Lake movement to a certain extent. Prices on the docks are firm and unchanged. The indications are bright for a continuation of an active Lake movement to the close of navigation.

Steam business is increasing in volume as the winter approaches. There is a better feeling in certain lines of manufacturing and consequently the demand for fuel is better. The larger trunk lines of the country are hauling more freight also and their fuel requirements are larger.

The general tone of the market is satisfactory and the recent advances in the domestic grades are being maintained on all sides. There are no complaints of price cutting and coal men generally believe that there is no occasion for shading figures. The indications for the coal trade for the winter are unusually bright.

Quotations in the Ohio fields are:

	Hocking	Pittsburgh	Pomeroy	Kanawha
Domestic lump	$1.65		$1.65	$1.65
2-in.	1.45	$1.15	1.50	1.45
Nut	1.15		1.50	
Mine-run	1.20	1.00	1.25	1.20
Nut, pea and slack	0.60		0.60	0.50
Coarse slack	0.50	0.65	0.50	0.40

Hampton Roads, Va.

Shipments of coal over Hampton Roads piers during the past week have been poor again. While up to the first of the month one or two shippers had an accumulation, there is today not a single operator who has any surplus coal at Hampton Roads.

The circular and maximum price of $2.70 at Hampton Roads during the past several months is now the minimum. Sales have been reported at $2.70 to $3, and while there has not yet been a general advance, this may be reasonably expected at any time.

Dumping over Hampton Roads piers for the month of August did not measure up to the million tons, as predicted last week. The Norfolk & Western piers handled 425,947 tons, the Chesapeake & Ohio piers at Newport News 332,191 tons, and the Virginian Ry. pier at Sewall's Point, 123,560 tons, or a total of 981,698 tons, an increase of about 5000 tons over July.

Birmingham, Ala.

The coal market in Alabama is strengthening up some and prices are improving. The production during the last quarter of the year will be as heavy as the operators can make it. There are numerous small contracts coming in and practically immediate delivery is being asked.

The Pratt Consolidated Coal & Iron Co. is mining between 8000 and 10,000 tons of coal per day now at its several mines. The Montevallo mines are also working every day, the product being in strong demand at this time of the year, just as the fall is about to set in.

Detroit, Mich.

The prices of both anthracite and bituminous coal have advanced so rapidly, that it is now rumored that local coal men may be quizzed by a grand jury.

Operators refuse to give out any exact quotations from the mines and most of them will not contract for any large tonnages. The local dealers emphatically deny that a combination exists in the city, but the large consumers say that a uniform price exists, and is being generally maintained.

According to one of the large dealers in this city, the demand for all kinds and grades has been unusual, and he claims that the consumer is largely responsible for the premature raise in prices. During the rumor that a fuel famine was due, the majority of the larger consumers tried to buy as much coal as they could store before prices advanced. As there was no spot coal on track, the demand for mine shipments was unusually heavy for this season of the year. Foreseeing that they would be unable to meet the rush of orders at former quotations, the operators boosted their prices.

The conditions out in the state are very similar, and a premium of 50c. a ton is being asked on all grades.

The market today is as follows, f.o.b. mines.

	W.Va. Gas	Pocahontas	Pittsburgh	Hocking
Domestic lump	$1.70			$1.65
Lump and egg		$2.50		
¾ lump	1.25		$1.30	1.30
Washed nut				
Washed pea				
Mine-run	1.15	1.35	1.15	1.20
Slack	0.95	1.10	0.90	1.00

Anthracite—There is practically no anthracite arriving at this point, and the scarcity is so unusual that some dealers are asking a premium of 75c. a ton. No contracts whatever are being accepted.

Coke—The market on coke has advanced about 50c. a ton, and it is becoming very scarce just at present, owing to the fact that the demand is unusually heavy on account of the scarcity of anthracite.

Chicago

It seems evident, in the opinion of Chicago coal men, that it will be exceptionally difficult for all dealers to obtain enough anthracite coal. At the present time only a few are getting a comfortable supply.

In a large number of instances the producers are not attempting to supply the widespread demand. There is a heavy demand for splint coal which has been short as a result of labor troubles and a shortage of cars. Prices for smokeless are strong and mine-run is commanding $1.25 while lump and egg sells at $2.25, the mines.

Screenings are selling all the way from 30c. to 60c. a ton, the mines. There is a good demand for furnace and foundry cokes.

Prevailing prices at Chicago are:

	Sullivan Co.	Springfield	Clinton	W.Va.
4-in. lump	$2.37@2.47			
Domestic lump		$2.32	$2.27	
Egg	2.37@2.47			4.05
Steam lump		1.97	2.12	
Mine run	1.99½	1.87	1.92	3.30
Screenings	1.47@1.52	1.27	1.27@1.32	

Coke—Prices asked for coke are: Connellsville, $5@5.10; Wise County, $4.85@5; byproduct, egg and stove, $4.75@4.85; byproduct, nut, $4.75@4.85; gas house, $4.75@4.85.

St. Louis, Mo.

Despite the extremely warm weather the past week or two, the market has been going up on both Standard and high-grade coals. Country demand is extremely good, and indications are that from this time on it will be a question of getting coal. Owing to the various county fairs being held in Southern Illinois, there is a curtailed output. Even were the miners ready to work, it is doubtful as to whether they would get more than three days a week, on account of the car shortage which prevails on all roads in the high-grade field, and also on the Illinois Central in the Standard field.

The prevailing prices are:

Franklin County	
Lump and egg	$1.60@1.75
No. 1 nut	1.35@1.45
Screenings	0.50@0.60
Carterville	
Lump and egg	$1.45@1.60
No. 1 nut	1.05@1.15
Screenings	0.50@0.60
No. 1 washed	1.60@1.70
No. 2 washed	1.25@1.35
No. 3 washed	1.05@1.15
No. 4 washed	0.80@0.90
No. 5 washed	0.60@0.70
Murphyboro Big Muddy	
Lump and egg	$2.00
Trenton	
Lump and egg	$2.00
Mount Olive	
6-in. lump	$1.35
2-in. lump	1.25
Standard	
6-in. lump	$1.20
2-in. lump	1.05
Screenings	0.40
Mine-run	0.85

Spokane, Wash.

Summer prices on coal still prevail in Spokane and the surrounding territory but dealers are anticipating a raise by the first of October. The only notice of advance up to the present time was that

received by local dealers from the Gunn-Quealey Co. in Wyoming. These people have notified local dealers of a 50c. raise effective Oct. 1.

A shortage of cars has been noticed but this always occurs about this time of the year. Local dealers only have about half as much coal stored this year as last year. The prevailing prices are as follows:

Rock Springs (Wyoming)	$9.00
Roslyn steam (Washington)	6.25
Bellview steam (Canada)	6.25
Bellview furnace (Canada)	8.25
Owl Creek (Wyoming)	9.00
Carney (Wyoming)	8.25
Roundup (Montana)	8.00
Bear Creek (Montana)	8.25
Hill Creast (Canada)	6.25
McGillvray steam (Canada)	6.25
Corbin steam (Canada)	6.25

Production and Transportation Statistics

Various Railroads, Rivers and Canals

The following is a comparative statement of the fuel movement over various railroads, rivers and canals for June, 1911-12.

Railroads	1911	1912
Baltimore & Ohio[2]	2,872,745	3,259,014
Buffalo, Rochester & Pittsburgh[2]	630,424	681,701
Buffalo & Susquehanna[2]	161,968	143,209
Chesapeake & Ohio[2 4]	1,237,521	1,476,414
Erie[4]	681,685	297,940
Huntington & Broad Top Mountain[2 3]	87,496	64,230
New York Central & Hudson River[2]	588,743	496,368
Norfolk & Western[2 3]	1,610,436	2,089,902
Pennsylvania (East of Pittsburgh & Erie)[2 5]	5,038,591	5,479,552
Pittsburgh & Lake Erie.[2 5]	1,405,666	1,582,105
Pittsburgh, Shawmut & Northern[3]	106,898	133,719
Southern[4]	301,684	365,593
Virginian[2 3]	245,625	256,070
Western Maryland	231,259	227,010
Rivers and Canals		
Barren River, Lock No. 1	120	132
Black Warrior River, Lock No 12	398	167
Canal and Falls at Louisville	17,129	59,223
Chesapeake & Delaware Canal	11,739	3,982
Chesapeake & Ohio Canal	25,516	21,808
Davis Island Dam	55,040	169,730
Green River, Lock No. 1	1,124	1,950
Kanawha River, Lock No. 11	78,340	165,080
Kentucky River, Lock No. 1	1,800	5,104
Monongahela River	480,372	1,034,655

[1]Figures throughout this table have been reduced to a uniform basis of short tons.
[2]Includes coal received from connecting lines.
[3]Includes company's coal.
[4]April and four months' figures.
[5]Does not include company's coal hauled free.

Ohio Coal Traffic Statement

The following is a comparative statement of bituminous shipments over the principal Ohio railroads for the first six months of the current year and last year, in short tons:

	1911	1912
Hocking Valley	1,458,340	1,857,187
Toledo & Ohio Central	788,581	930,793
Baltimore & Ohio	816,380	1,086,027
Wheeling & Lake Erie	1,502,723	1,956,478
Cleveland, Lorain & Wheeling	1,247,488	1,545,316
Zanesville & Western	487,217	577,901
Pennsylvania Co	932,423	2,849,005
Lake Erie, Alliance & Wheeling	564,164	519,433
Marietta, Columbus & Cleveland R.	14,112	61,016
Wabash, Pittsburgh Terminal Ry.	36,784	15,049
Kanawha & Michigan Ry.	32,666	71,515
Detroit, Toledo & Ironton		114.365
Total	7,880,878	11,584,085

The Car Situation

The gross surplus of cars on Aug. 29 was 36,047, as compared with 58,623 two weeks earlier. The total shortage reported was 26,297, as against 14,722 reported on Aug. 15. At this time last year there were more than eight times as many cars idle, although the decrease on the corresponding date, as compared with two weeks earlier, had been 19,629 cars.

The following table shows the surplus and shortage of cars on 172 roads on Aug. 29:

	Surplus	Short	Net Surplus
Box	14,180	14,907	727
Flat	1,853	3,179	1,326
Coal, gond. and hopper	5,293	7,008	1,715
Other kinds	14,721	1,203	13,518
Total	36,047	26,297	9,750

On the corresponding date last year the net surplus of idle cars was 84,541. Two years ago it was 60,022, in 1909, 106,677, and in 1908, 221,058.

Anthracite Shipments

The following is a comparative statement of anthracite shipments for August, 1911-12, and the totals for the first 8 months of the current year, in long tons:

	1912	1911	8 Mos.
Phila. & Reading	1,286,651	912,475	7,765,878
Lehigh Valley	1,261,814	989,285	7,119,158
Cent. R. R. N. J.	901,870	682,704	5,139,578
Del. Lack. & West.	918,734	843,238	5,519,630
Del. & Hudson	696,130	658,661	3,957,185
Pennsylvania	525,732	430,041	3,426,278
Erie	743,950	813,790	4,620,058
Ont. & Western	241,710	201,602	1,410,958
Total	6,576,591	5,531,796	38,958,723
8 Months, 1911			45,645,444

Southwestern Tonnage

The Southwestern Interstate Coal Operators' Association has issued the following comparative statement of tonnage:

	1912		May	
State	April	May	1911	Difference
Missouri	189,751	194,505	151,722	+42,783
Kansas	303,216	254,924	326,592	—71,668
Arkansas	95,994	103,647	101,247	+2,400
Oklahoma	164,270	131,220	172,214	—40,994
Totals	753,231	684,296	751,775	—67,479

Statement only covers the tonnage of members of the Association which is estimated to be at least 95% of the entire tonnage produced in the four states. The tonnage of Bache & Denman in Oklahoma and Arkansas is now included.

Baltimore & Ohio R.R.

The following is a comparative statement of fuel movement over the B. & O. R.R. and affiliated lines for June and July, 1911-12, in short tons:

	June		July	
	1911	1912	1911	1912
Coal	2,379,859	2,501,318	2,378,859	2,519,881
Coke	292,413	424,009	286,238	368,720
Total	2,672,272	3,015,327	2,665,097	2,888,601

Foreign Markets.

Oriental Markets

Japan—There is no new business to report since last writing and the market remains in the same lifeless state; prices are weak but freights are still so high and firm that dealers can not come to terms, besides which exchange is at the moment very unfavorable.

Manchuria—No new business has come to pass for the same reasons as existed a fortnight ago.

Kailan—Prices are steady; deliveries are going on as usual but there is very little talk of new business which, however is not to be wondered at at this time of the year.

Great Britain

Aug. 30—New business is quiet, and with supplies increasing the tendency is downward for early loading. Tonnage arrivals are quite inadequate to meet shippers' requirements. Prices are approximately as follows:

Best Welsh Steams	$4.08 @ 4.14
Best Seconds	3.90 @ 4.02
Seconds	3.78
Best Dry Coals	4.08
Best Monmouthshires	3.72
Seconds	3.48
Best Cardiff Smalls	2.73
Seconds	2.52

The prices for Cardiff coals are f.o.b. Cardiff, Penarth, or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both exclusive of wharfage, and for cash in 30 days—less 2½%.

Financial Notes

Pittsburgh Coal Co.—It is rumored that this company contemplates paying off the accrued dividends on the preferred stock, and retiring the whole of the preferred issue at $120. The outstanding preferred is $27,071,800, on which about 37 per cent. or $10,000,000 accumulated dividends are due.

Reading Co.—During the past year, 4% was paid on the first preferred, 4% on the second preferred and 6% on the common, the total dividend distribution being $7,000,000. Renewal and betterment expenditures approximated $2,100,000, while the general mortgage sinking fund charges amounted to under $500,000. With these deductions the year's earnings dwindled to a year's surplus of $600,000.

Lackawanna Coal & Lumber Co.—This company has acquired 90 per cent. of the $5,000,000 capital stock of the Paint Creek Collieries Co. by depositing with the Union National Bank, Scranton, $1,000,000 bonds to be exchanged for said stock at $20 bonds for $100 stock. Interest on bonds is so deposited that it will not commence until Jan. 1, 1913, and the bonds not to be delivered until the Lackawanna Coal & Lumber Co. bond underwriting syndicate is terminated.

Virginia Iron, Coal & Coke Co.—During the past year there have been many rumors pertaining to the sale of this company, although one of the officials states that such a transaction is not even being considered. It is further stated that the company has an immediate asset of $3,500,000, which could be utilized at any time if necessary. During the past ten years the bonded indebtedness has been reduced from $9,000,000 to $5,000,000 and the company hopes to eventually wipe out the entire amount.

Utah Company of Maine.—This company controls some 11,226 acres of land, of which 7526 are coal lands. Five seams outcrop on the company's property, the lowest of which averages 16 ft. thick, and the next above 12 ft. The company's engineers estimate that this lower seam alone contains at least 140,000,000 tons of minable coal on the company's land. The company is now producing at the rate of 500,000 tons per annum and at a moderate expenditure can readily increase this to 1,000,000 tons.

Throwing The Searchlight On Advertising

Little Talks on a Big Subject for Coal Age Readers

By the Ad. Editor

The pyramids of Egypt form one of the seven wonders of the world.

They were built by the kings as tombs and everlasting monuments of their own greatness.

Only a few years ago did we begin to learn why they were built and what the numerous carvings and writings meant.

They were boastful stories of the great deeds performed during the life of the king and as such they give us a more or less hazy idea of Egypt as it was thousands of years ago.

Of the pyramids there are in all about seventy. The size of the Great Pyramid is appalling when we consider the times in which it was built.

Think of this one pile of stone containing 90,000,000 cubic feet of solid masonry! It is 480 feet high and 764 feet square at the base.

It is estimated that it took 360,000 men 20 years to build it.

Some of the stones are so big that we have no machines today powerful enough to move them.

They were handled by machinery of some sort, however, for the marks are still plainly seen after so many centuries.

This Great Pyramid stands exactly on the 13th parallel of latitude, and its four corners point exactly to the four cardinal points of the compass.

But *how* did they do it? How were those enormous stones set in place?

How did they harden copper and brass?

How did they make their wonderful dyes?

There are no records to show. These arts are lost—and lost completely.

The *methods* of Egypt died because there was no way to record them. Printer's ink, the great preserver, was not known. And so, while the accomplishments of Egypt were mighty, they were only *useful* for a limited time and restricted to a limited area and a comparatively few people.

Today, through the medium of engineering papers, modern methods of doing things are being faithfully recorded and *spread broadcast.* They are being *advertised* to a world which makes use of them.

If Egypt, wise and learned, had left records far less perfect in just the Selling Section of this paper, we would be going on where she left off. We would be using their advanced knowledge.

There are men today who are doing big things in the coal-mining field.

Their deeds are written in improved machinery and recorded in the Selling Section.

In the gradual development of better methods and machines, we sometimes lose sight of the tremendous significance of this progress. Too many lose sight of prŏgress itself and these are they who refer to the Selling Section as "mere advertising."

Advertising? Yes; but it's a reliable record of current events of our own history that none of us can afford to overlook.

It pays to advertise only because it pays to buy advertised goods